THE
RAILWAY GAZETTE

Price: Two Shillings | FRIDAY, APRIL 14, 1961 | Annually £5 by post

Further in the lead

'ENGLISH ELECTRIC' equipped the first 25 kV A.C. multiple unit train to enter service on British Railways.

'ENGLISH ELECTRIC' also delivered the first main-line diesel-electric locomotive under the British Railways modernisation plan.

THE FIRST REPEAT ORDER for A.C. multiple unit train equipments was received by 'ENGLISH ELECTRIC' and is in the course of delivery.

in association with:
VULCAN FOUNDRY
and ROBERT STEPHENSON & HAWTHORNS

'ENGLISH ELECTRIC'

TDE.488.

Compare the difference...

G-E universal locomotives are the result of skilled manufacturing and superior product design

❶ **DIESEL ENGINE** of modern 4-stroke turbosupercharged design is built for long life and fuel economy. Exclusive cylinder design provides better cooling, longer engine life, and easier "upper end" maintenance with maximum interchangeability. Articulated connecting rod doubles effective rod bearing area.

❷ **GENERATOR** is mounted directly on the engine. This permits single-bearing construction which eliminates mis-alignment. Flashover tendency is designed out. Simple flexible electric cables are the only transmission connection to the trucks. Ample capacity is available for steep grades, heavy trains and high speeds.

❸ **CONTROLS** are the essence of simplicity. Responsiveness and reliability have been assured by keeping the number of moving parts to a minimum and by using factory-set adjustments.

❹ **HIGH-SPEED TRUCKS** complete with powerful traction motors mounted on each axle have a world-wide reputation for reliability, long life, and high efficiency. Single spur gear of motors drives each axle directly.

MECHANICAL DESIGN is simple, rugged, efficient. Dynamic braking ❺ can be easily added to facilitate train handling, reduce brake shoe wear. A single, direct-driven variable speed fan ❻ gives increased air cooling efficiency. Interchangeability and standardization throughout the universal line reduce parts inventory.

IN ADDITION to these product features, the engineering skill of General Electric is utilized for motive power recommendations based on surveys by experienced technicians; research and development to constantly improve components and concepts, testing complete locomotives on a private multi-gage test track.

Throughout the world General Electric locomotives have established enviable records of performance by producing high gross ton mileages at low cost. To learn how these universal diesel-electric locomotives can benefit your railway, contact your International General Electric representative. 135-E33

Progress Is Our Most Important Product

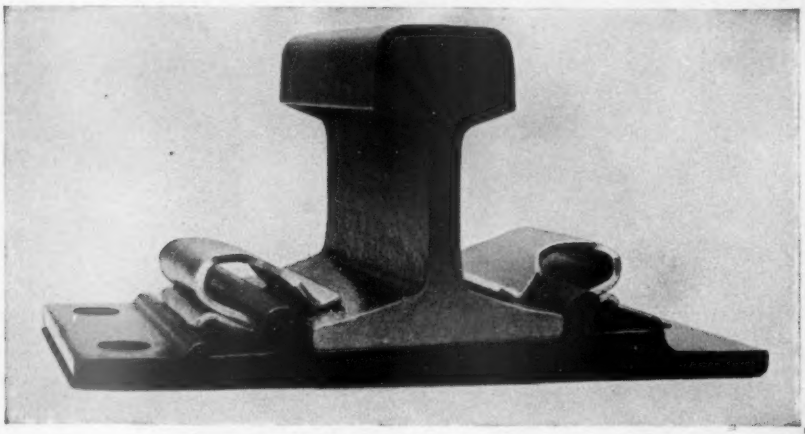
GENERAL ELECTRIC

LOCOMOTIVE AND CAR EQUIPMENT DEPARTMENT • ERIE, PENNSYLVANIA, U.S.A.
Represented throughout the world by the International General Electric Company
Main Office: 150 East 42nd Street, New York 17 New York, U.S.A.

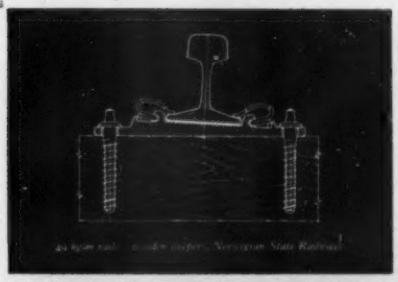
HEY-BACK

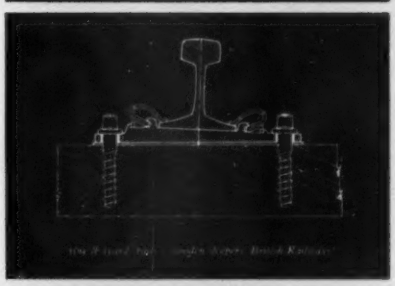
REGISTERED TRADE MARK

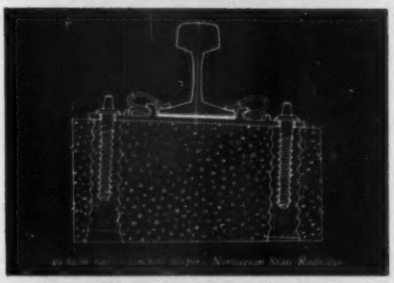
POSITIVE ELASTIC RAIL FASTENING

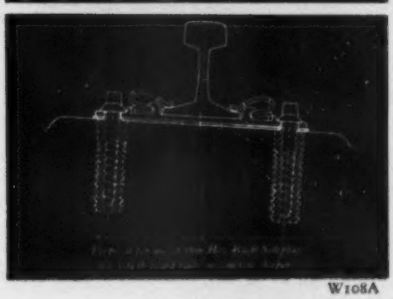


THE UNITED STEEL COMPANIES LTD









* Simple and self-securing
* Attractive in cost in view of reduced maintenance and replacement expenses
* Transversely stiff and vertically elastic
* Definitely anti-creep
* Equally serviceable on timber and concrete sleeper
* Excellently suited for pre-assembly
* Secure and safe
* Constant spring pressure on the rail at every point of contact independent of the means of securing the soleplate to the sleeper
* The best security against sun-buckling, irrespective of the length of rails
* Quicker and easier exchange of rails than by any other known method of rail fastening
* Track security and economy

The Hey-Back System comprises only two types of components—a rolled steel soleplate and a spring clip. The soleplates can be fastened by conventional methods. Once secured, they need never be disturbed. The spring clips are easily entered and driven home, and as easily released, yet resisting all forces caused by the movement of the train. Correct position of the spring clip is ascertained at a glance during routine inspections. Resilient pads can be used, both as shock-absorbers and to provide insulation for track signalling.

WORKINGTON

IRON AND STEEL COMPANY

WORKINGTON **CUMBERLAND**

RAILWAY DEPARTMENT:
8-10 GROSVENOR GARDENS, VICTORIA, LONDON S.W.1.
PHONE: SLOANE 4533 GRAMS: UNISTEELS, SOWEST, LONDON

W108A

A

JOHN BULL

TRACTION MOTOR VENTILATING BELLOWS

Exceptionally tough and flexible, John Bull Traction Motor Ventilating Bellows are manufactured from specially compounded rubber containing a high proportion of synthetic rubber. They are reinforced with square-woven fabric, bias cut and covered with rubber-impregnated stockinette. The various laminations are moulded into a homogeneous material which is unaffected by oil and heat and retains its resiliency.

Rectangular and Circular types can be made to customers' requirements. Rectangular Bellows can be supplied with plastic rings and terylene cord cross-ties.

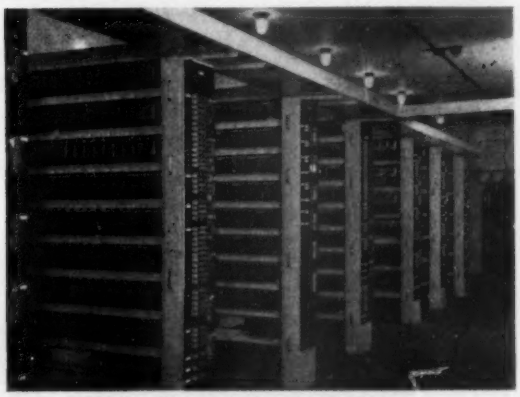
In addition to Ventilating Bellows, John Bull products include Vacuum and Air Brake Hose, Steam Heating Hose and Moulded Rubber products.

JOHN BULL RUBBER CO. LTD. (Mechanical Products Division) LEICESTER
TELEPHONE: 36531

Miniature Type Control Desk at Southend Central

MINIATURE CONTROL DESKS AND RELAYS

Southend Central and Pitsea Junction on the Eastern Region of British Railways have recently been equipped with the "all-electric" push-button system employing a miniature type control desk which enables one man to operate the entire interlocking area.
In the relay rooms approximately 1,500 miniature relays have been fitted, thus effecting a considerable space economy.



Relay Room at Southend Central

WESTINGHOUSE

SIGNALLING *for* **RAILWAY MODERNISATION**

BRITISH DESIGN AND MANUFACTURE

WESTINGHOUSE BRAKE AND SIGNAL CO. LTD., 82 York Way, King's Cross, London, N.1

Saxby & Farmer (India) Private Ltd., Calcutta. **McKenzie & Holland (Australia) Pty., Ltd., Melbourne.**

Westinghouse Brake and Signal Co., S.A. (Pty.), Ltd., Johannesburg. *Agents—Bellamy & Lambie, Johannesburg.*

Bulk production of Vacuum Brake Cylinders for British Railways modernisation programme

To meet the demand for fully fitted freight trains giving higher overall speeds

* *The 'E.I.' Brake cylinder incorporates many special features and was designed jointly by the technical staffs of Gresham and Craven Ltd. and British Railways.*

Illustration shows a batch of

18" CLASS E.I. Brake Cylinders

awaiting despatch at our Worsley Brake Works near Manchester

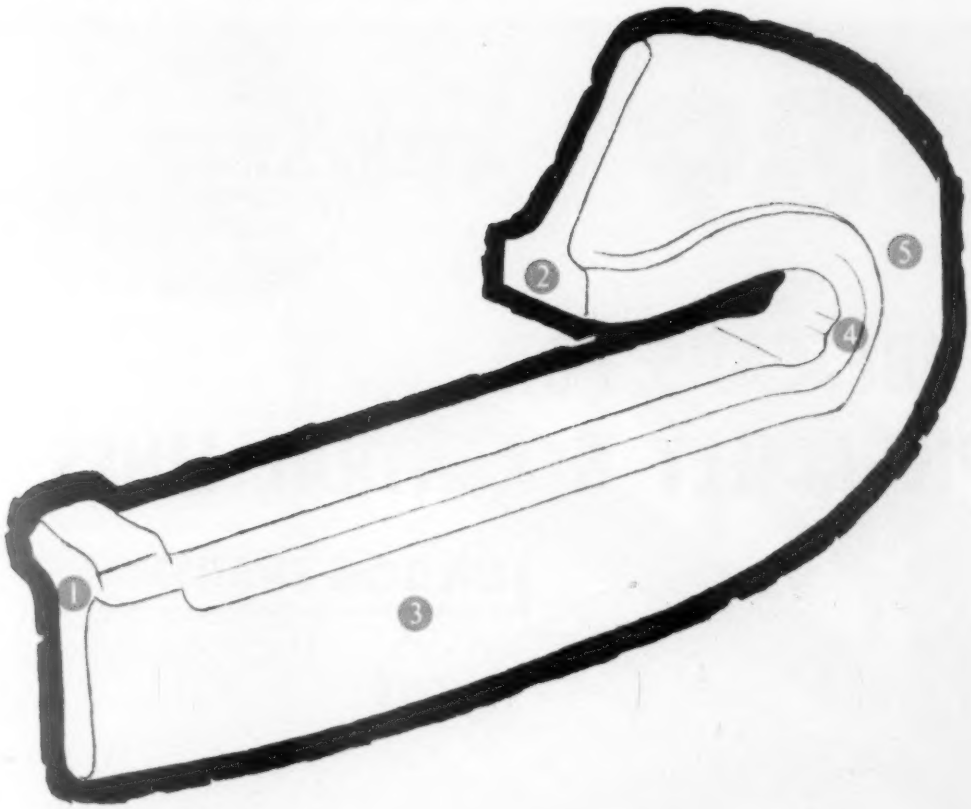
GRESHAM & CRAVEN LIMITED

Designers and Manufacturers of complete Vacuum Brake equipments for Locomotives, Railcars and all Rolling stock.

LONDON OFFICE & SALES: 15 WHITEHALL, SW1 TEL.: TRAFALGAR 6611-2 CABLES: LOCO, BRAKE, LONDON

HEAD OFFICE & WORKS: BRAKE DIVISION, P.O. BOX NO. 4, NORFOLK STREET, WORSLEY ROAD NORTH, WALKDEN, MANCHESTER. TEL.: FAO 2041 (14 LINES). GRAMS: BRAKE, PHONE, FARNWORTH.

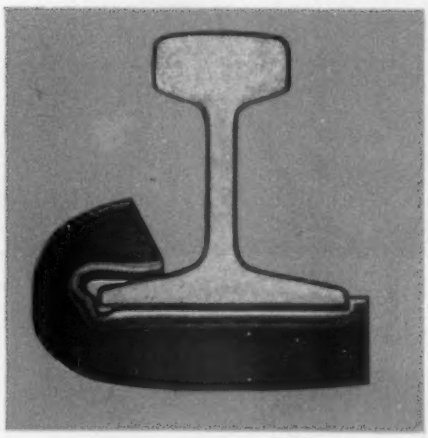
3815



Fair T Rail Anchor

Five important features which make the FAIR T the most reliable appliance for prevention of rail creep.

1. Tee Section for strength and extra resilience.
2. Wide Jaw Surface for maximum holding power.
3. Large, Flat Bearing Face saves damage to sleeper.
4. Overdrive Stop prevents damage by overdriving.
5. Driving Face facilitates and speeds application.



THE P. & M. CO. (ENGLAND) LTD.

1a GROSVENOR GARDENS, LONDON, S.W.1

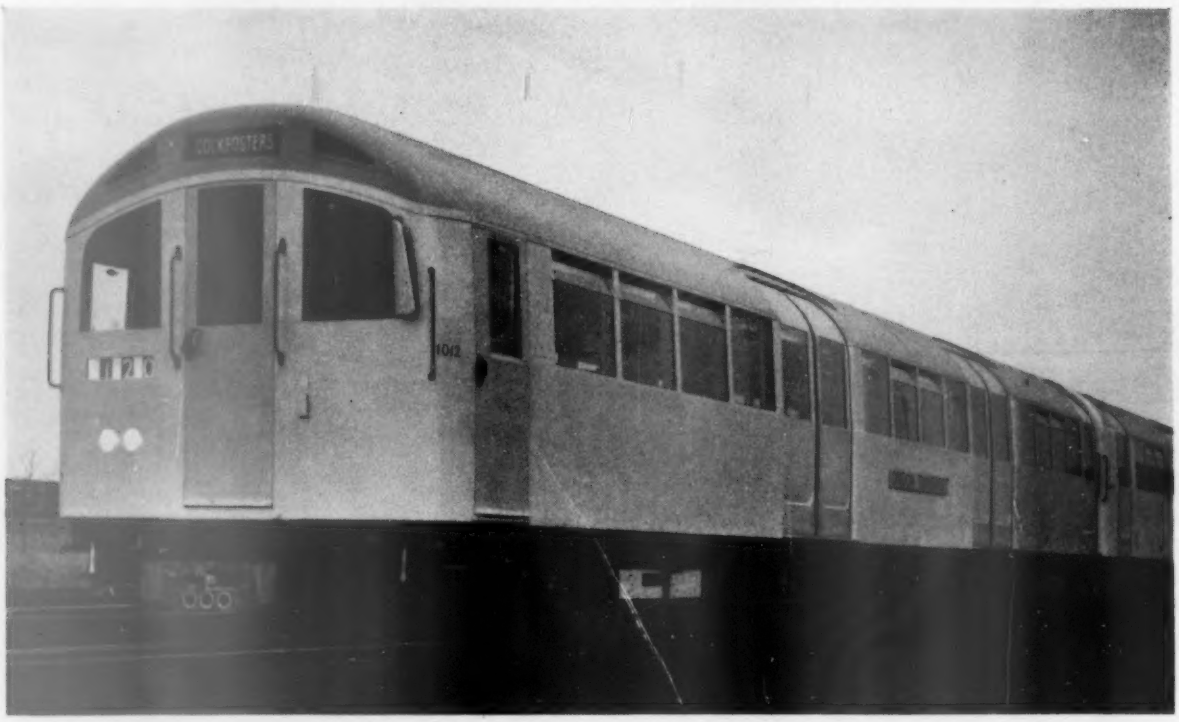
F.R.A./2

589

METRO-CAMMELL

TUBE CARS FOR PICCADILLY & CENTRAL LINES

LONDON TRANSPORT



PRODUCTION IS IN FULL SWING
and nineteen 7-Car and twenty-seven 8-Car trains have now been completed

METROPOLITAN-CAMMELL CARRIAGE & WAGON CO. LTD.

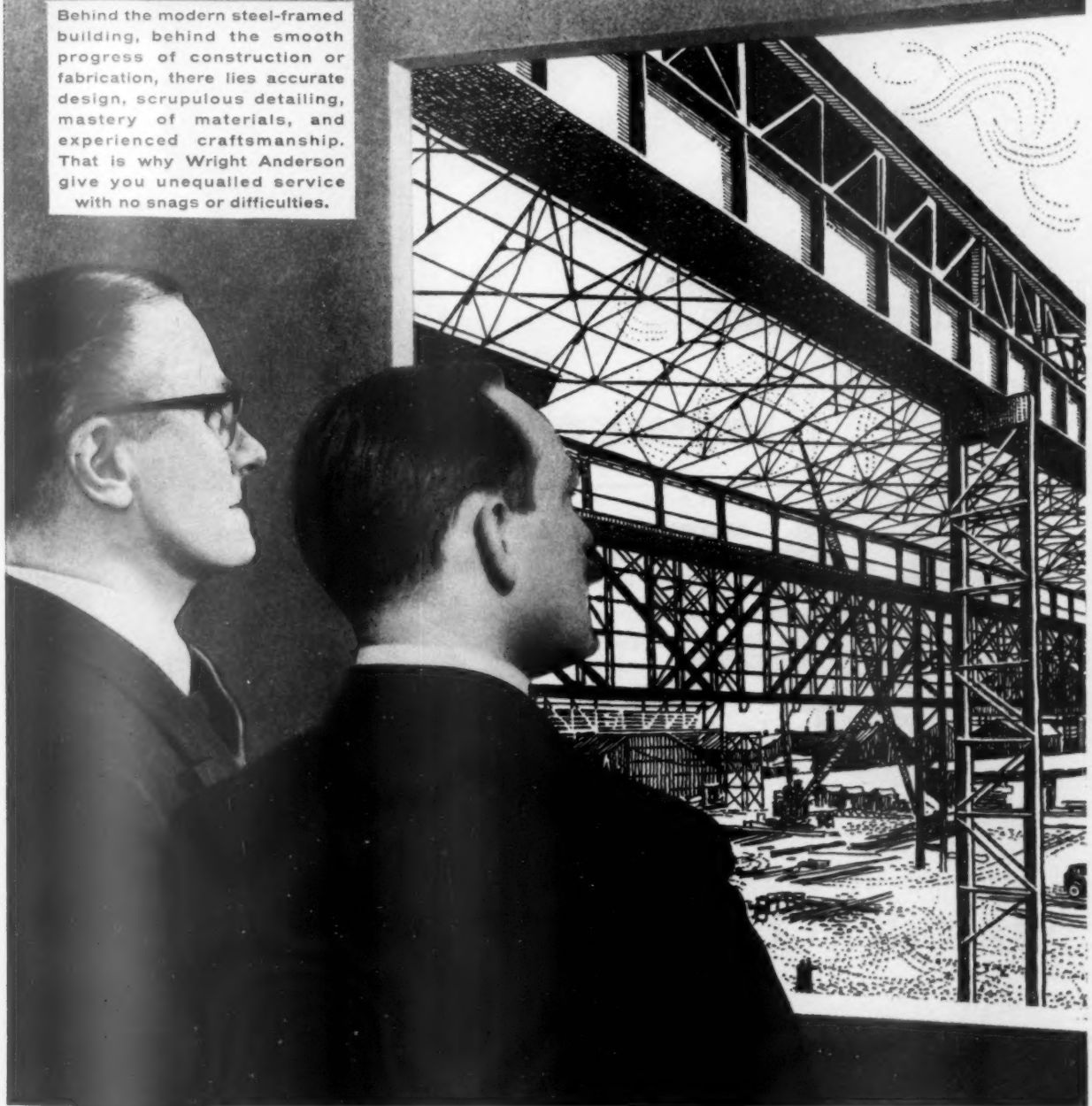
HEAD OFFICE
SALTLEY · BIRMINGHAM 8

LONDON OFFICE
VICKERS HOUSE · BROADWAY · WESTMINSTER S.W.1.

WRIGHT ANDERSON

CONSTRUCTIONAL ENGINEERS AND BRIDGE BUILDERS

Behind the modern steel-framed building, behind the smooth progress of construction or fabrication, there lies accurate design, scrupulous detailing, mastery of materials, and experienced craftsmanship. That is why Wright Anderson give you unequalled service with no snags or difficulties.



WRIGHT ANDERSON & CO LTD — DESIGN FABRICATION ERECTION — STRUCTURAL ENGINEERS — RELIABILITY

WRIGHT ANDERSON AND COMPANY LIMITED

G.P.O. BOX 2 GATESHEAD CO DURHAM

Tel: Gateshead 72246 (3 lines) • Grams: "Construct Gateshead"

LONDON OFFICE: 4 St. Georges Street, London, W.1. • Telephone: MAYfair 2394

Contractors to H.M. Government Departments, Central Electricity Generating Board, National Coal Board, Atomic Energy Authority and Crown Agents for Overseas Governments and Administrations.

In your hands

POWER TO STOP!

MOST Railway Rolling Stock, at home and overseas, relies on
VACUUM BRAKES

Driver's Vacuum Brake Valve

18" E Class Rolling Ring BR Cylinder

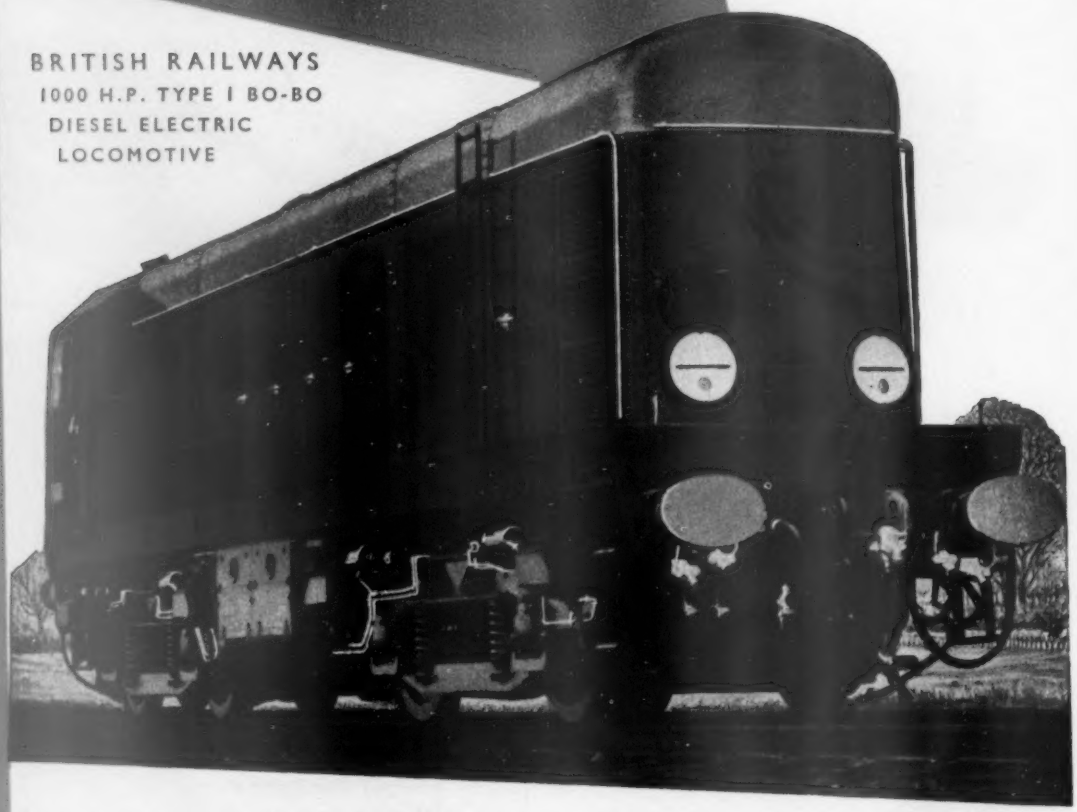
THE VACUUM BRAKE CO. LTD.

VICTORIA WORKS,
MILLHOUSES, SHEFFIELD 8

Member of the Birfield Group

whatever the aspect . . .
PIRELLI-GENERAL moves ahead
An electrified railway can only be as dependable as the cable that serves it.
Whatever the needs of railway electrification, they can be met by Pirelli-General—for signalling; for communications; for the transmission of power, overhead and underground.
Pirelli-General cables are made in compact and self-contained plants at Southampton and Eastleigh where there are full facilities for research and development in design and manufacture; and a complete sales and advisory service.
PIRELLI-GENERAL
best way to buy
PIRELLI-GENERAL CABLE WORKS LIMITED SOUTHAMPTON & EASTLEIGH
P6466

BRITISH RAILWAYS
1000 H.P. TYPE I BO-BO
DIESEL ELECTRIC
LOCOMOTIVE



50 OF THESE LOCOMOTIVES ARE NOW IN SERVICE ON BRITISH RAILWAYS (AND A FURTHER 78 BUILDING). CONSTRUCTED BY THE ENGLISH ELECTRIC CO. LTD., VULCAN FOUNDRY LTD., AND MESSRS. ROBERT STEPHENSON & HAWTHORNS LTD., FOR MIXED TRAFFIC SERVICE.
THEY ARE EQUIPPED WITH–

METCALFE-OERLIKON
PATENTED
AIR AND VACUUM BRAKE EQUIPMENT

Manufactured at the Romiley and Dukinfield Works of

DAVIES & METCALFE LTD
ENGINEERS, ROMILEY · Tel.: WOO 2626 (3 LINES)

MAKERS OF MODERN AIR BRAKE EQUIPMENT AND ENGINEERS TO THE LOCOMOTIVE INDUSTRY SINCE 1870

RG.9.

OTTERMILL

PART OF THE MODERNISATION PROGRAMME

OTTERMILL *100 amp Miniature Busbar Trunking installed in a typical Carriage Servicing Shed, hanging sockets are provided at intervals to enable a 50 volt 3 phase supply to be used for carriage cleaning equipment.*

OTTERMILL BUSBAR TRUNKING systems are making an important contribution towards modernisation of British Railways. Our **BUSBAR TRUNKING** is in use at Diesel and Electric Locomotive Works, Carriaging Servicing Sheds, Stock Repair Works and Continental Traffic Depots all over the country.

OTTERMILL

For full details of trunking systems, switchboards, fuse switches and oil circuit breakers write to:

OTTERMILL SWITCHGEAR LTD

SALES OFFICE: **166 VICTORIA STREET, LONDON, S.W.1**
Telephone: ABBey 5095/6 Telegrams: Busbar Sowest

WORKS: **OTTERY ST. MARY 264**
Telephone: Ottery St. Mary 264 Telegrams: Busbar Ottery St. Mary

LOOK

there's an appointed stockist of

SIMMONDS

NYLOC

shock and vibration proof

SELF-LOCKING NUTS

on your doorstep!

BEDFORD Randalls Ltd.,
20-22 St. Mary Street, Bedford.
Telephone: Bedford 67488

BELFAST Kennedy & Morrison Ltd.,
12 Library Street, Belfast.
Telephone: Belfast 30231 (5 lines)

BIRKENHEAD Tom Wallace (Liverpool) Ltd.,
52 Cleveland Street, Birkenhead.
Telephone: Birkenhead 3434

BIRMINGHAM G. F. Bridges Ltd.,
Humpage Road, Bordesley Green, Birmingham 9.
Telephone: Victoria 5511 (10 lines)

G. F. Bridges Ltd.,
Harvills Hawthorne, Hill Top, West Bromwich.
Telephone: Wednesbury 0453

W. H. & G. Walker & Co.,
11 Edward Street, Parade, Birmingham, 1.
Telephone: Central 0575

BRISTOL Woodberry, Chilcott & Co. Ltd.,
Atlas Street, Feeder Road, Bristol 2.
Telephone: Bristol 70407

CARDIFF John Hall (Tools) Ltd.,
23 Churchill Way, Cardiff, and all branches.
Telephone: Cardiff 22242 (7 lines)

CHESSINGTON H. S. S. Ltd., Cox Lane,
Chessington, Surrey.
Telephone: Lower Hook 1005-9

EDINBURGH D. F. Wishart & Co. Ltd.,
P.O. Box No. 74,
18, Picardy Place, Edinburgh 1.
Telephone: Waverley 1444 (5 lines)

GLASGOW Land, Speight & Co. Ltd.,
2, Fitzroy Place,
Sauchiehall Street, Glasgow, C.3.
Telephone: Central 1082-3

HALIFAX Smith, Nicholson & West Ltd.,
P.O. Box No. 10,
Gaol Lane, Halifax.
Telephone: Halifax 5757 (5 lines)

HULL The Hull Factoring Co. Ltd.,
227-229 Anlaby Road, Hull.
Telephone: 36725 (3 lines)

LIVERPOOL Tom Wallace (Liverpool) Ltd.,
Hope Street, Liverpool, 1.
Telephone: Liverpool Royal 6401 (5 lines)

LONDON
The Alder Hardware & Electrical Co. Ltd.,
199, New King's Road, Fulham, London, S.W.6.
Telephone: Renown *6421* P.B.X.

Lewis Hunter & Co.,
25, Laurence Pountney Lane,
Cannon Street, London, E.C.4.
Telephone: MINcing Lane 8805 and 9082

F. Miller & Co. (London) Ltd.,
Rectory Road, Acton, London, W.3.
Telephone: Acorn 5201 P.B.X.

LONDON Telco Ltd.,
3, Newman Street, London, W.1.
Telephone: MUSeum 5701 (4 lines)

LUTON Randalls (Luton) Ltd.,
Selbourne Road, Luton.
Telephone: Luton 52351

MANCHESTER J. A. Challiner & Co. Ltd.,
77-83 Downing Street, Manchester, 1.
Telephone: ARDwick 3221-2-3

MIDDLESBROUGH McNays Ltd.,
G.P.O. Box 14,
Middlesbrough.
Telephone: Middlesbrough 45111 (7 lines)

POOLE J. R. Smith & Sons (Structural) Ltd.,
Hamworthy, Poole, Dorset.
Telephone: Poole 1300 (7 lines)

SHEFFIELD The Needham Engineering Co. Ltd.,
P.O. Box No. 23,
Townhead Street, Sheffield 1.
Telephone: Sheffield 27161 (10 lines)

SLOUGH F. Miller & Co. (London) Ltd.,
Cambridge Avenue,
Slough, Bucks.
Telephone: Slough 25511 (10 lines)

TEDDINGTON H. S. S. Ltd.,
25, Church Road, Teddington, Middlesex.
Telephone: Teddington Lock 4441/4

SEND YOUR ENQUIRIES TO YOUR NEAREST STOCKIST PLEASE

SIMMONDS AEROCESSORIES LIMITED

TREFOREST · PONTYPRIDD · GLAMORGAN

Branches: LONDON, BIRMINGHAM, MANCHESTER, STOCKHOLM, COPENHAGEN, BALLARAT, SYDNEY, JOHANNESBURG, NAARDEN, MILAN, NEW YORK, BRUSSELS, HEIDELBERG, MANNHEIM

A MEMBER OF THE FIRTH CLEVELAND GROUP

HAD YOUR **NYLOC** *BROCHURE YET?*
Contact your Stockist and have all the up-to-date NYLOC information. Ask also for the latest issue of the Simmonds Engineering Data Sheets.

CRC 5OM

'ON-TIME' ARRIVAL

SEE US ON STAND No. P5
AT THE
ENGINEERING, MARINE WELDING AND NUCLEAR ENERGY EXHIBITION
OLYMPIA
APRIL 20th TO MAY 4th

Brush Type II locomotive with Mirrlees JVST engine draws into No. 6 Platform at King's Cross with the empty stock to form the 5.10 p.m. for Royston...

...The London Commuter knows when he's on to a good thing but as he sits back little thought is spared for the Mirrlees diesel which gets him in on-time. Now, in many parts of British Railways, Eastern Region the story is the same—punctuality and reliability—thanks to Mirrlees diesels.

Mirrlees **diesels** **provide the power**

MIRRLEES, BICKERTON & DAY LIMITED
HAZEL GROVE · STOCKPORT · CHESHIRE
Tel.: Stepping Hill 1000 (15 lines) *Grams.:* "Mirrlees, Telex, Manchester"

A member of the Hawker Siddeley Group

RTE 10

* IMPROVED PITCH SELECTION
* INCREASED PITCH ACCURACY
* REDUCED HANDLING TIMES

ON

D·S·G

PRECISION LATHES
WHEN

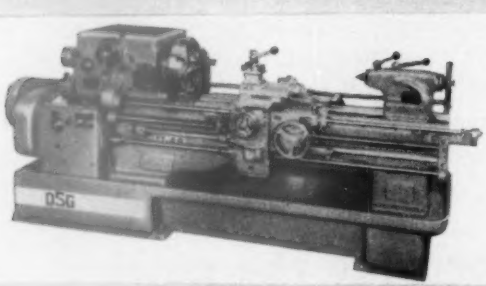
MULTI-START & COARSE PITCH THREADING

Each size of lathe in the D.S.G. range incorporates a totally enclosed screwcutting Gearbox, providing the means for rapidly selecting thread pitches.

The Headstock is fitted with a feed increasing device for coarse pitch threading.

The lathe spindle is fitted with an indexing dial which indicates the precision indexing obtained from a ground divider in the Headstock. This dial is standard equipment on TYPES 13-1 and 17 Toolroom lathes.

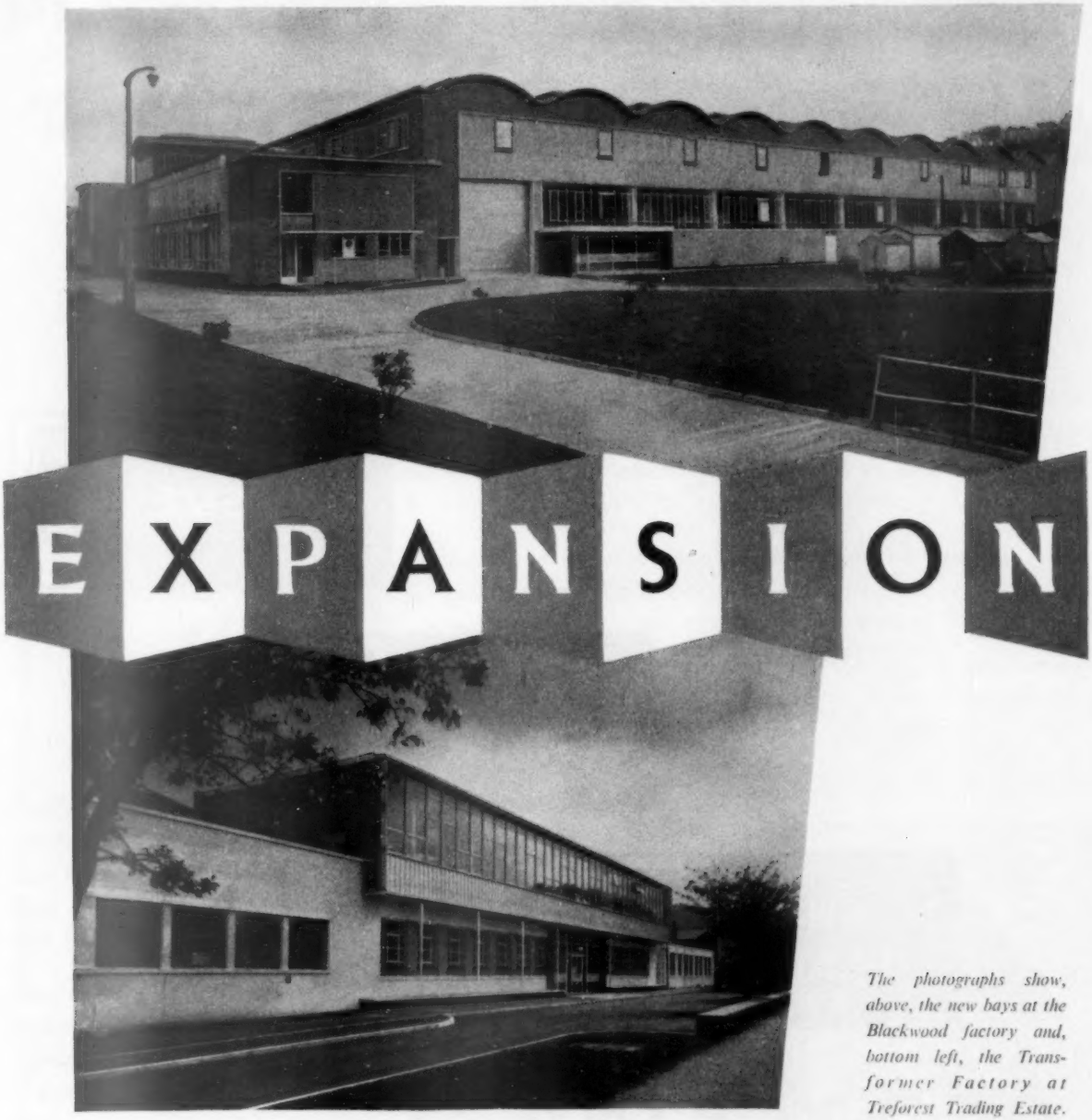
WHEN MULTI-START AND COARSE PITCH THREADING, THE COMBINATION OF THESE FEATURES ENSURES THAT ALL THE ABOVE ADVANTAGES ARE OBTAINED.



DEAN, SMITH & GRACE LTD. KEIGHLEY, ENGLAND

Telex No. 51-123 · Telegrams: LATHES Keighley
Tel. No. 5261 (7 lines)

Manufacturers of
13-30" Swing Engine Lathes
Surfacing and Boring Lathes
Toolroom Lathes



The photographs show, above, the new bays at the Blackwood factory and, bottom left, the Transformer Factory at Treforest Trading Estate.

The success of our research, designs, and manufacturing policy in the field of switchgear is clearly indicated by our continuous expansion and the confidence shown in S.W.S. products throughout the world.
The fact that S.W.S. equipment is repeatedly 'first choice' confirms this confidence and an expanding organisation such as ours needs more space to meet the consequent ever-growing demand for our products. The current building programme includes factory and office extensions, a new research and laboratory block and a new transformer works.

SOUTH WALES SWITCHGEAR LIMITED
BLACKWOOD · MONMOUTHSHIRE · WORKS AT TREFOREST AND BLACKWOOD
SWITCHGEAR · FUSE-SWITCHGEAR · TRANSFORMERS · CONTROL BOARDS

SW 26

If you're conveying

ANYTHING

ANY SIZE

ANY DISTANCE

ANY PLACE

OVERHEAD CONVEYORS · FLOOR CONVEYORS · CRANES · HOISTS · SKI-WRACKERS · GRABS · RUNWAYS

GEO. W. KING

WILL CUSTOM-TAILOR A CONVEYING SYSTEM FOR YOU ANYWHERE IN THE WORLD

KING

REGISTERED TRADE MARK

There is no product we cannot convey. KING'S have specialist groups to deal with small, medium, and large installations for *any*-sized product.

Just name your product and state your problem—GEO. W. KING will solve it the most economical way possible. And you'll get the benefit of KING know-how and experience—over 40 years—all over the world.

For further details and illustrated literature write or telephone:—

GEO. W. KING LTD Argyle Works · Stevenage · Herts. · Telephone: Stevenage 440

A KING representative will be pleased to call on you anywhere in the world.

PLASSERMATIC VKR-04 PX 10

The World's First Levelling and Tamping Machine

1957-1959 developed
1960 put into operation
1961 already a world-wide concept

This machine is being described by Permanent Way experts as the greatest progress in the past 20 years in the field of railway machinery.

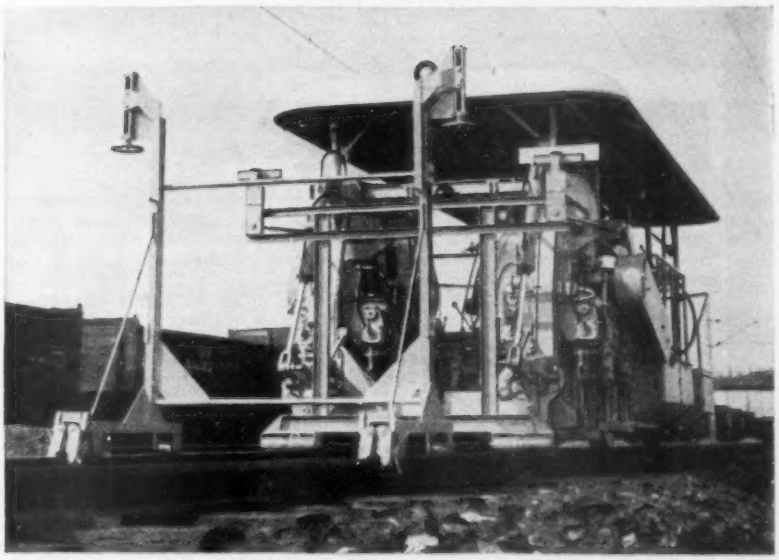
The performance of the machine is its best recommendation, the number of machines sold is the best recommendation for us.

20 Machines were bought by the British Railways

21 Machines were sold to Western Germany

Further PLASSERMATIC VKR-04 PX 10 machines are being put into operation by the Railways of the following countries:

Austria
Australia
Canada
France
Italy
Mozambique
Netherlands
South Africa
Tunisia
USA

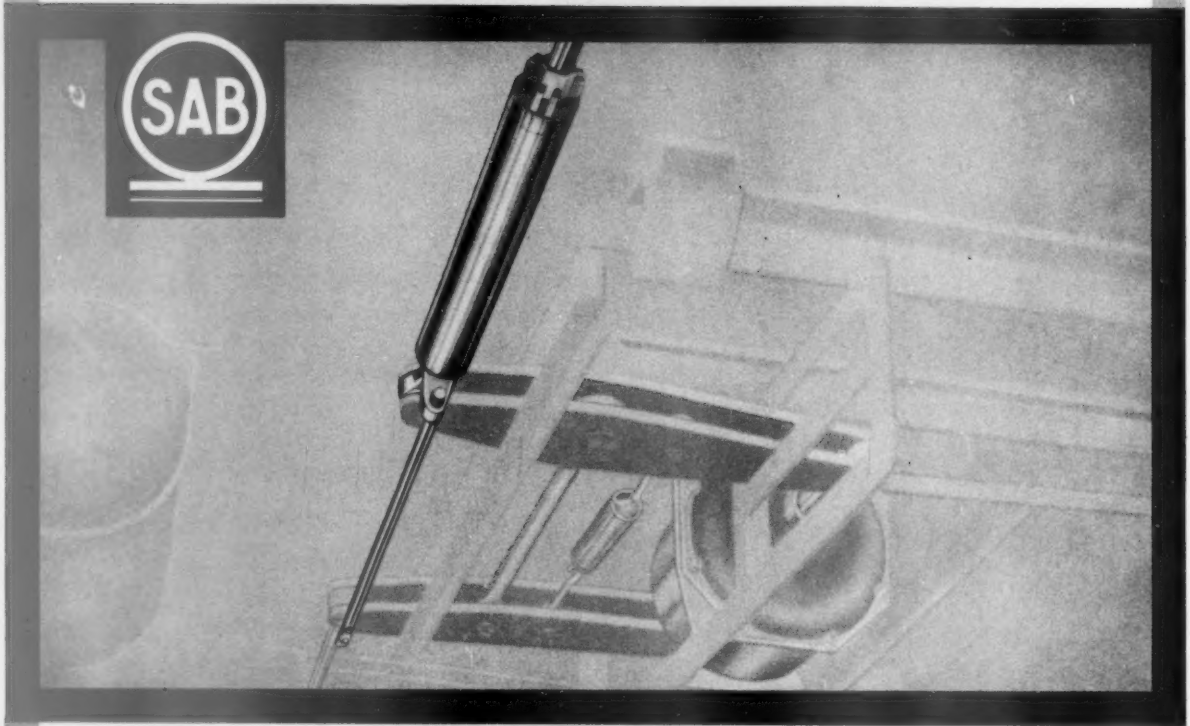


16 men and 50 track jacks for the advance work or 2 lifting machines in front of a normal tamping machine can be saved.

Plasser & Theurer Railway Machinery

Head Office: 3, JOHANNESGASSE, VIENNA I, AUSTRIA Factories: LINZ a.d. DONAU, AUSTRIA

SAB DOUBLE-ACTING RAPID-WORKING BRAKE REGULATOR TYPE DRV



IN MORE THAN 50 COUNTRIES

Although the productions of the SAB Company cover a wide range of empty/loaded braking devices, the product most closely associated by railway engineers with the symbol SAB is the double-acting, rapid-working SAB Brake Regulator.

SAB Brake Regulators have been delivered to leading Railways in more than 50 countries all over the world. In most of these countries, SAB Brake Regulators have been adopted as a standard component of the brake equipment. They have gained a reputation for efficiency and reliability, resulting in an ever increasing number of installations on all types of railway vehicles.

BRAKE REGULATOR TYPE DRV

The most advanced member of the SAB slack adjuster family is the fully automatic, double-acting, rapid-working Brake Regulator Type DRV, the result of more than 40 years of specialised experience of automatic slack adjustment.

The DRV regulator is built into the brake rigging as part of a pull rod. It rapidly takes up or pays out slack, thus maintaining correct brake block clearances. In addition it contributes to easier replacement of worn brake blocks, no manual adjustment being required after the operation. The DRV Brake Regulator also makes it possible to use a simple mechanical empty/loaded braking device.

TECHNICAL ASSISTANCE

Whenever brake slack adjustment and empty/loaded braking problems require an effective solution, it is advantageous to consult SAB.

The SAB Company has built up an important service organisation which, with its expert knowledge, is ready to deal with any problem relating to brake rigging and brake installation for all types of railway vehicles.

The SAB Service Engineering Department checks proposed brake rigging designs and provides detailed installation drawings as a service to customers. It also assists whenever necessary at the actual mounting on the vehicle.

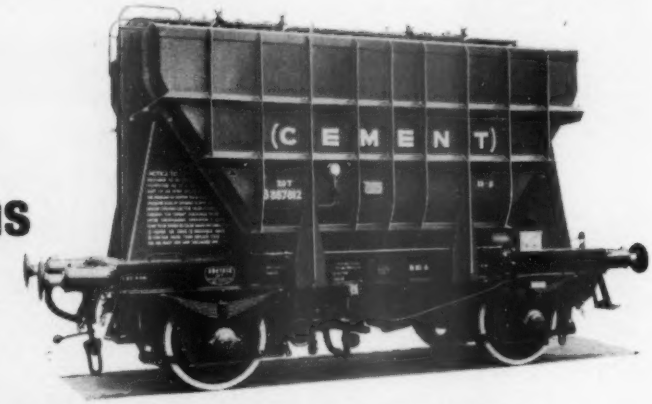
BROMSREGULATOR MALMÖ — SWEDEN

FOWLERS
FOR A
BLOOMING
GOOD
STEEL
CASTING

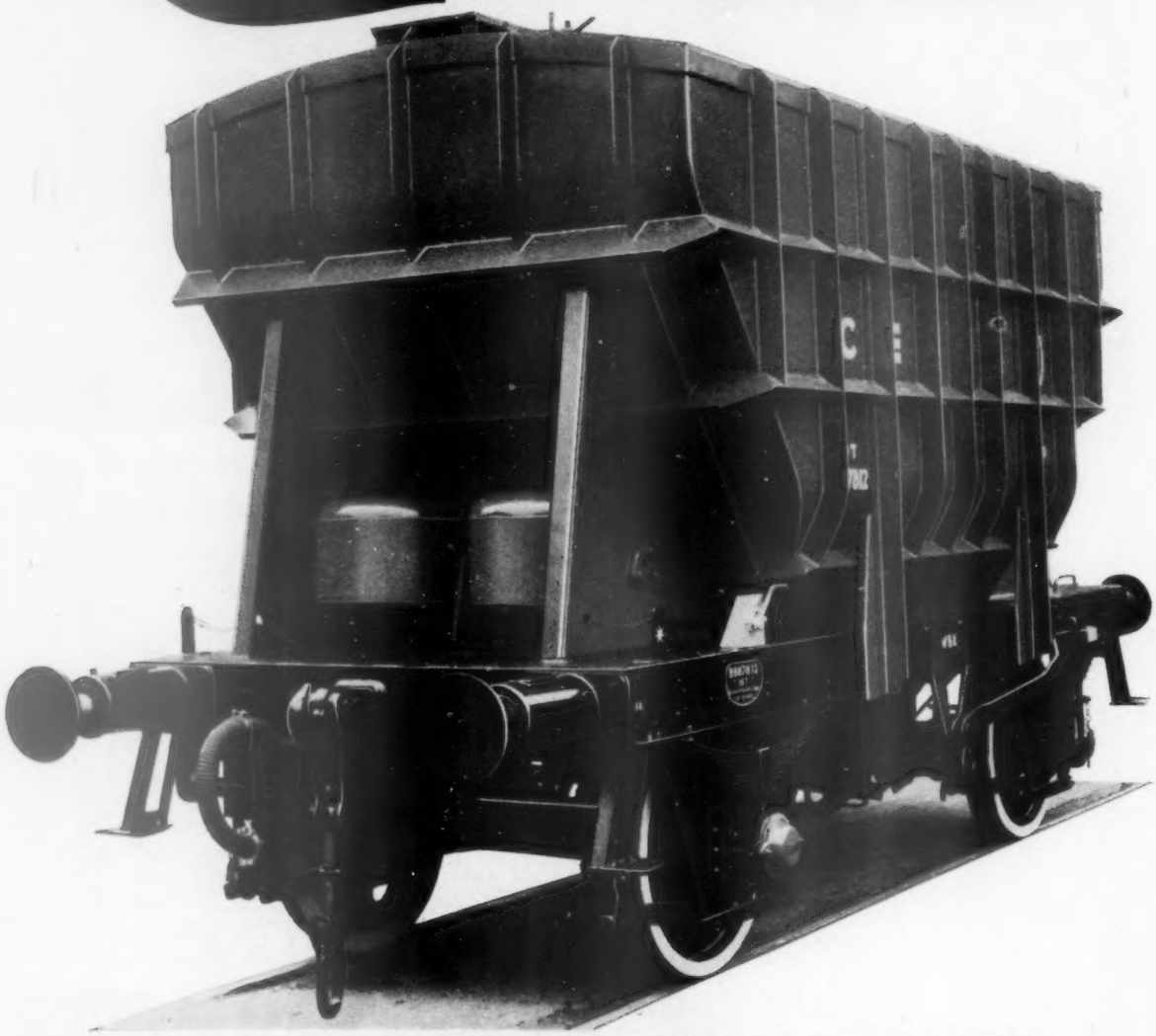
Technical Brochure from

JOHN FOWLER & CO (LEEDS) LTD Sprotborough Foundry, Sprotborough, Doncaster

BTC 'Presflo' Bulk Cement Wagons



by GLOUCESTER



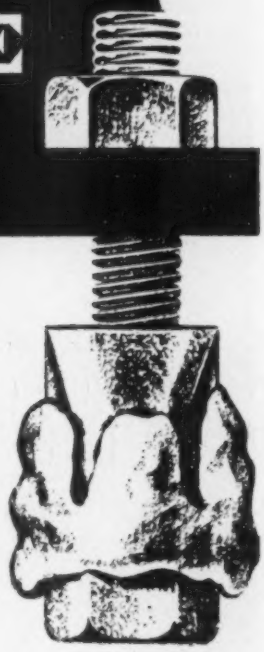
One of a large contract for 20-ton Cement Wagons built for British Transport Commission. Fitted with discharge equipment and S.K.F. roller bearings. Gauge 4 ft. 8½ ins. Wheelbase 10 ft. 6 ins.

GLOUCESTER RAILWAY CARRIAGE & WAGON CO. LTD., GLOUCESTER · ENGLAND

Telephone: Gloucester 22111 *Telegrams: Railcar, Gloucester.*

LONDON OFFICE: 1-5 New Bond Street, London, W.1. Phone: Hyde Park 2956

A SECURE ANCHORAGE



Where a heavy article must be positioned *before* it is bolted to concrete, brickwork or masonry — use Expandabolts. If the machinery or equipment can be placed over a bolt previously fixed — choose Anchor Bolts.
Both these simple fixing devices provide a secure anchorage which remains firm under the most violent movement.

HERE'S HOW THEY WORK:

EXPANDABOLTS
A hole is made and the complete bolt (set screw, saw-toothed split-sleeve and cone wedge) is placed in it. The set screw is removed and the article placed in position. The set screw is reinserted and tightened. This draws the wedge into the split-sleeve, forcing the saw-teeth to grip the concrete.

ANCHOR BOLTS
A hole is made, the bolt is inserted and the wedge is driven into the lead spreader, thus locking the bolt in position. The article to be fixed is then placed over the protruding bolt, and the nut is tightened.

philplug

EXPANDABOLTS AND ANCHOR BOLTS

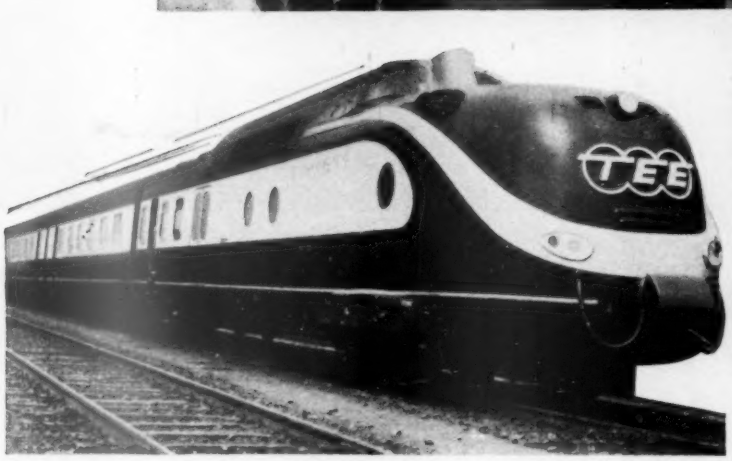
MISTER PHILPLUG

DISTRIBUTED BY:
EXPANDITE LIMITED, CHASE ROAD, LONDON, N.W.10
Telephone: ELGar 4321 (10 lines) ELGar 1551 (10 lines) Telex 25420
Trafford Park Road, Manchester 17 Telephone: Trafford Park 1285/6
36 Great North Road, Newcastle-upon-Tyne 2 Telephone: Newcastle 23992
EXPANDITE (IRELAND) LIMITED, Greenhills Road, Walkinstown, Dublin Telephone: 501512

ASSOCIATES AND DISTRIBUTORS THROUGHOUT THE WORLD

FROM BRITISH OXYGEN—
FOR BRITISH INDUSTRY
cut
ting
British Oxygen is constantly developing better tools for Industry. Whatever your cutting needs, we have a blowpipe or machine ready to do the job quickly and at low cost. Ask any of our 38 branch offices for experienced and expert advice.
The British Oxygen Company Ltd
LIGHT INDUSTRIAL DEPARTMENT · SPENCER HOUSE · 27 ST. JAMES'S PLACE · LONDON S.W.1
BOC

TRAVELLING COMFORT IN MODERN EXPRESS TRAINS



The present standard of comfort makes travelling in the modern express trains a special pleasure. It is, above all, the dust-free, temperature-controlled air that gives travellers great ease. This comfort is made possible by air-conditioning equipment running through the whole train and hidden from the eye—a marvel of technical development.

For instance, all Trans Europ Express Trains of the German Federal Railways (TEE) are equipped with **Luwa** air-conditioning plants, system **Jettair.** For the air-conditioning equipment shown at the International Exhibition in Brussels we were awarded the Silver Medal. The passengers of the German Sleeping Car Company (DSG) and the Compagnie Internationale des Wagons-Lits et des Grands Express Européens (CIWL) enjoy the advantages of this proved air-conditioning equipment.

Among other overseas railways the Iranian State Railway for their modernization programme have equipped all 1st and 2nd class passenger and dining cars with the **Jettair** system. The saloon train of H.M. the Shah, also, is being equipped with the **Luwa** system.

Top quality and continuous technical progress characterise the air-conditioning and pressure ventilation equipment built by us.

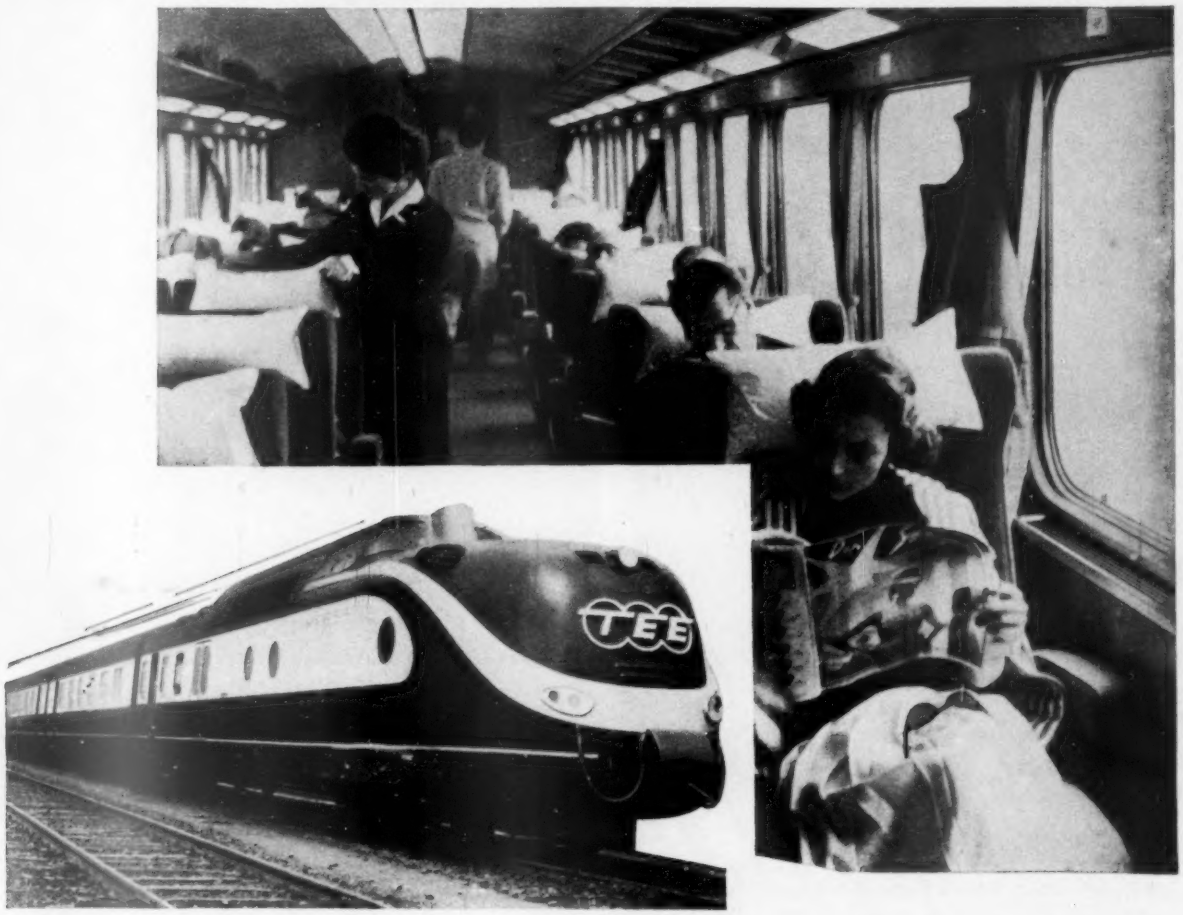
Luwa GmbH FRANKFURT AM MAIN, GERMANY

200-202, Hanauer Landstrasse. Telephone: 48541. Cable Address: Luwa Frankfurtmain. Telex: 0411775

Representatives for the United Kingdom and Colonial Territories:
Feska Industrial Equipments, Ltd., 2, Charlotte Street, London, W.1.

FROM BRITISH OXYGEN—
FOR BRITISH INDUSTRY
cut
ting
British Oxygen is constantly developing better tools for Industry. Whatever your cutting needs, we have a blowpipe or machine ready to do the job quickly and at low cost. Ask any of our 38 branch offices for experienced and expert advice.
The British Oxygen Company Ltd
LIGHT INDUSTRIAL DEPARTMENT · SPENCER HOUSE · 27 ST. JAMES'S PLACE · LONDON S.W.1
BOC

TRAVELLING COMFORT IN MODERN EXPRESS TRAINS



The present standard of comfort makes travelling in the modern express trains a special pleasure. It is, above all, the dust-free, temperature-controlled air that gives travellers great ease. This comfort is made possible by air-conditioning equipment running through the whole train and hidden from the eye—a marvel of technical development.

For instance, all Trans Europ Express Trains of the German Federal Railways (TEE) are equipped with **Luwa** air-conditioning plants, system **Jettair.** For the air-conditioning equipment shown at the International Exhibition in Brussels we were awarded the Silver Medal. The passengers of the German Sleeping Car Company (DSG) and the Compagnie Internationale des Wagons-Lits et des Grands Express Européens (CIWL) enjoy the advantages of this proved air-conditioning equipment.

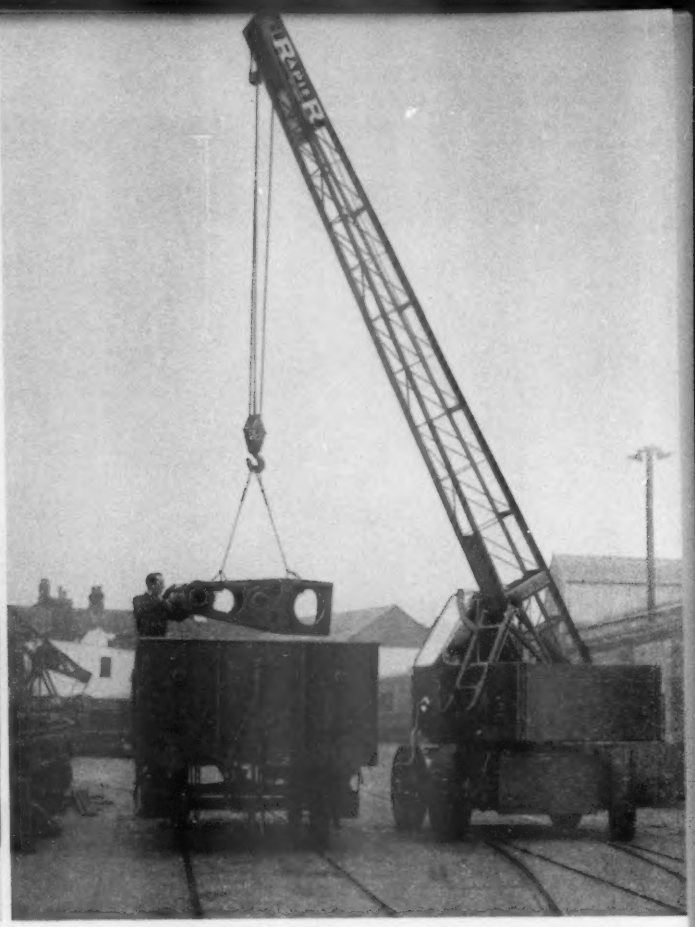
Among other overseas railways the Iranian State Railway for their modernization programme have equipped all 1st and 2nd class passenger and dining cars with the **Jettair** system. The saloon train of H.M. the Shah, also, is being equipped with the **Luwa** system.

Top quality and continuous technical progress characterise the air-conditioning and pressure ventilation equipment built by us.

Luwa GmbH FRANKFURT AM MAIN, GERMANY

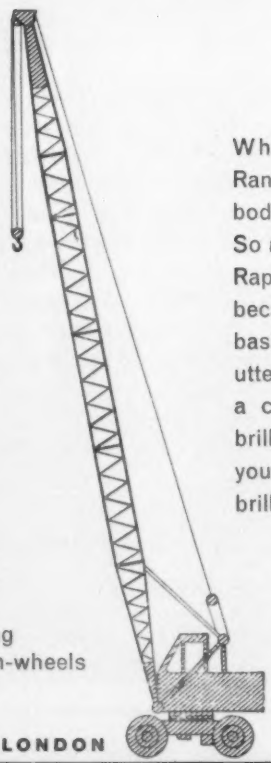
200-202, Hanauer Landstrasse. Telephone: 48541. Cable Address: Luwa Frankfurtmain. Telex: 0411775

Representatives for the United Kingdom and Colonial Territories:
Feska Industrial Equipments, Ltd., 2, Charlotte Street, London, W.1.



The brilliant new RAPIER

- Loads up to 6 tons free-on-wheels
- Cantilever jibs up to 40 feet
- Strut jibs up to 60 feet
- Two-motor travel drive giving electrical differential and full traction on both sides under all conditions
- High manoeuvrability — turning circle 21′ 0″
- Separate or simultaneous operation of all motions with full control from creeping to full speeds
- Diesel-electric drive
- Exceptionally smooth high speed slewing on cross roll bearing
- Safe, controlled power lowering under full load for both hoist and derrick
- Small tail radius — only 6′ 3″
- Centrally mounted superstructure giving best all round outreaches and weight distribution on the ground
- Great stability and full mobility when handling maximum loads through all motions free-on-wheels



When it comes to making cranes, Ransomes and Rapier know all that everybody else knows, and a bit more besides. So a new mobile crane by Ransomes and Rapier starts off with a terrific advantage, because you take for granted that its basic engineering and design will be utterly trustworthy. And when in addition a crane incorporates a whole team of brilliant new ideas, then you can be sure you're on to a world-beater. Like this brilliant new 511 mobile crane . . . .

RANSOMES AND RAPIER LTD, IPSWICH AND LONDON

A NEWTON CHAMBERS COMPANY

511 Mobile Crane

One of thirty-five 2,000-h.p. main-line diesel-electric locomotives supplied to the Rhodesian Railways by The English Electric Company Limited.

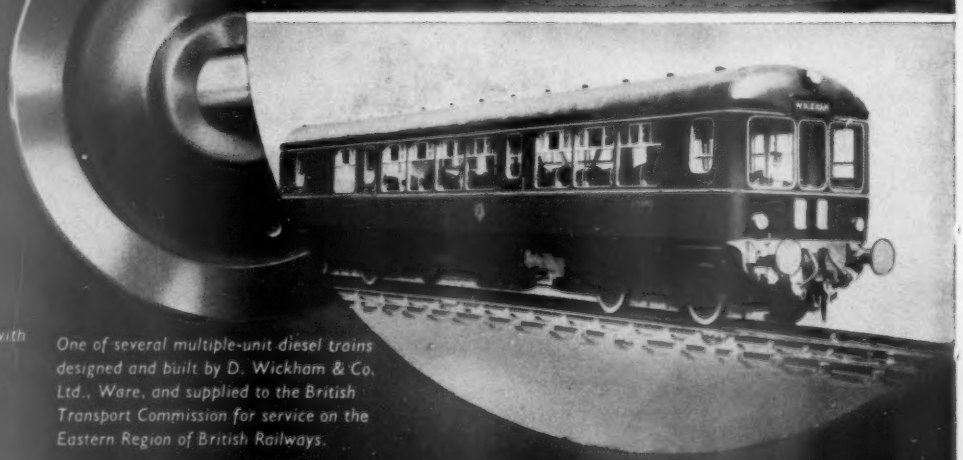
BAKER BESSEMER

TYRES · AXLES · SOLID WHEELS · DISC CENTRES · ASSEMBLED PAIRS OF WHEELS & AXLES

in service on railways all over the world

One of a number of tank wagons supplied by Rax-Werk G.m.b.h., Austria, to the Pakistan Government Railways.

B B



All the vehicles shown are fitted with Baker-Bessemer wheels and axles.

One of several multiple-unit diesel trains designed and built by D. Wickham & Co. Ltd., Ware, and supplied to the British Transport Commission for service on the Eastern Region of British Railways.

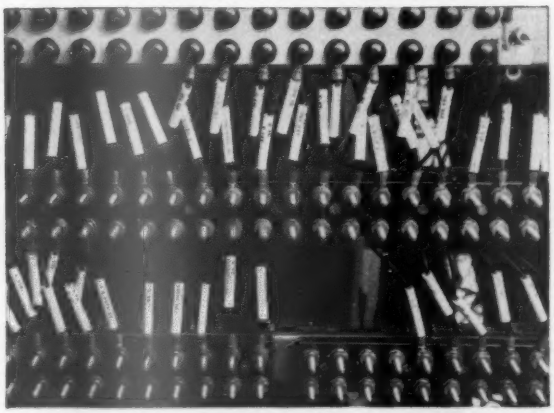
JOHN BAKER & BESSEMER LIMITED

REGISTERED OFFICE: KILNHURST STEEL WORKS G.P.O. BOX No. 3 ROTHERHAM YORKSHIRE
TELEPHONE MEXBOROUGH 2154-7 & 3793 TELEGRAMS: TYRES MEXBOROUGH

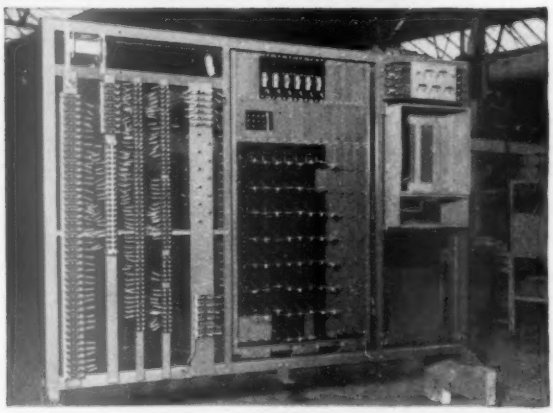
London Office: LOCOMOTIVE HOUSE, BUCKINGHAM GATE, LONDON, S.W.1. Telephone: VICtoria 5278-9

A E I-GRS Limited

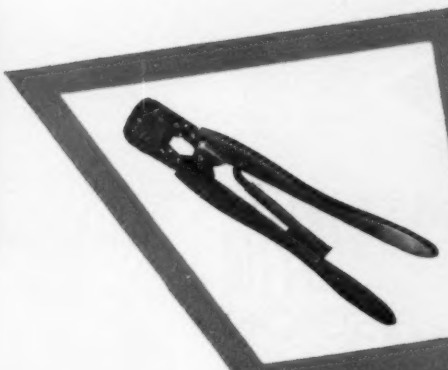
use *AMP solderless wiring devices



Close up showing *Plastibond Terminals.



Relay rack for a C.T.C. system



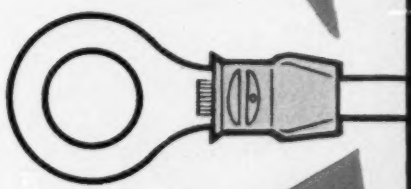
ENGINEERING Marine Welding & Nuclear Energy EXHIBITION

OLYMPIA LONDON APRIL 20-MAY 4 1961

STAND No. 9—ROW DD

the means . . .

*Plastibond Terminal



. . . to the end

Acknowledgements to Associated Electrical Industries-G.R.S. Limited

▶ SPEEDY APPLICATION ▶ LOWER APPLIED COSTS ▶ UNIFORM HIGH QUALITY ▶ HIGH ELECTRICAL AND MECHANICAL STABILITY

WRITE NOW ABOUT THE **CREATIVE** APPROACH TO BETTER WIRING

AIRCRAFT-MARINE PRODUCTS (GT. BRITAIN) LTD.

Head Office: Dept. 18 AMPLO HOUSE, 87/89 SAFFRON HILL, LONDON, E.C.1

Tel: CHANcery 2902 (7 lines) Cables: AMPLO LONDON TELEX. Telex. 23513

Works: Scottish Industrial Estate, Port Glasgow, Scotland

AMP ★ TRADE MARK

*Trade Mark of AMP incorporated, U.S.A.

SOUTH AFRICA: DISTRIBUTOR: E. S. MOWAT & SONS (PTY) LTD., 51-57 MILNE STREET, P.O. BOX 437, DURBAN, NATAL, SOUTH AFRICA

AUSTRALIA: MANUFACTURING COMPANY: AIRCRAFT-MARINE PRODUCTS (AUSTRALIA) PTY. LTD. BOX 78 P.O. AUBURN, N.S.W. AUSTRALIA

ASSOCIATED COMPANIES IN: U.S.A., CANADA, HOLLAND, FRANCE, GERMANY, ITALY, JAPAN, PUERTO RICO AND MEXICO

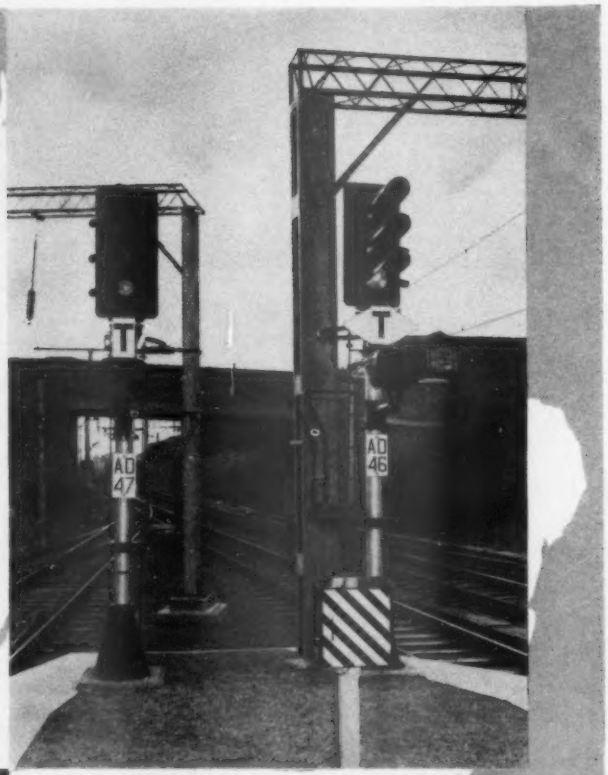
AP148

SGE

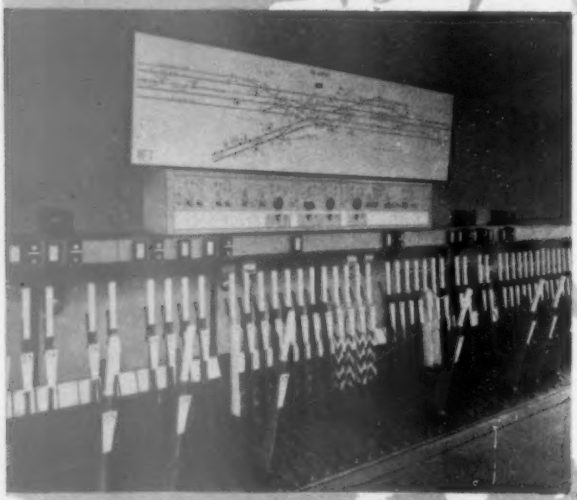
RE-SIGNALLING FOR SCOTTISH REGION

Airdrie to Kelvinhaugh Section of North Clyde Electrification project

Introduction of colour light signalling
Elimination of 11 mechanical boxes
Two new electro-mechanical boxes
10 boxes re-equipped



Starter and shunt signals at Airdrie Station.



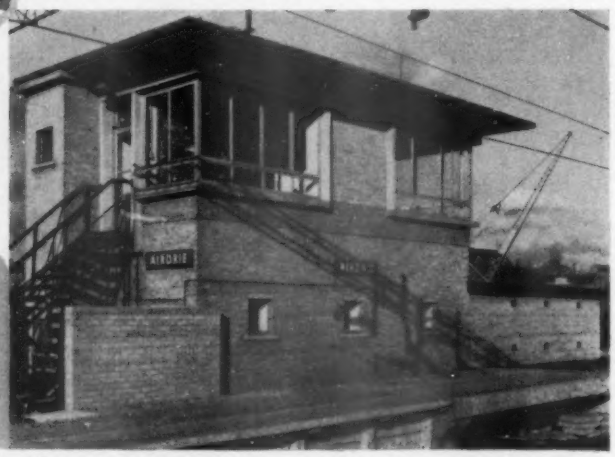
Hybrid control of signals and points at Bellgrove signal box.

The Airdrie to Kelvinhaugh Re-Signalling Scheme has proved extremely successful since it was officially opened on November 5th, 1960. This signalling contract for S.G.E. involved 16 miles of double track, including the Springburn and Bridgeton Cross Branches. 350 track circuits, 50 motor operated points and 120 colour light signals were installed.

The system is controlled by switch panels in 10 rehabilitated mechanical boxes and 2 new electro-mechanical boxes, dispensing with 11 mechanical signal boxes.

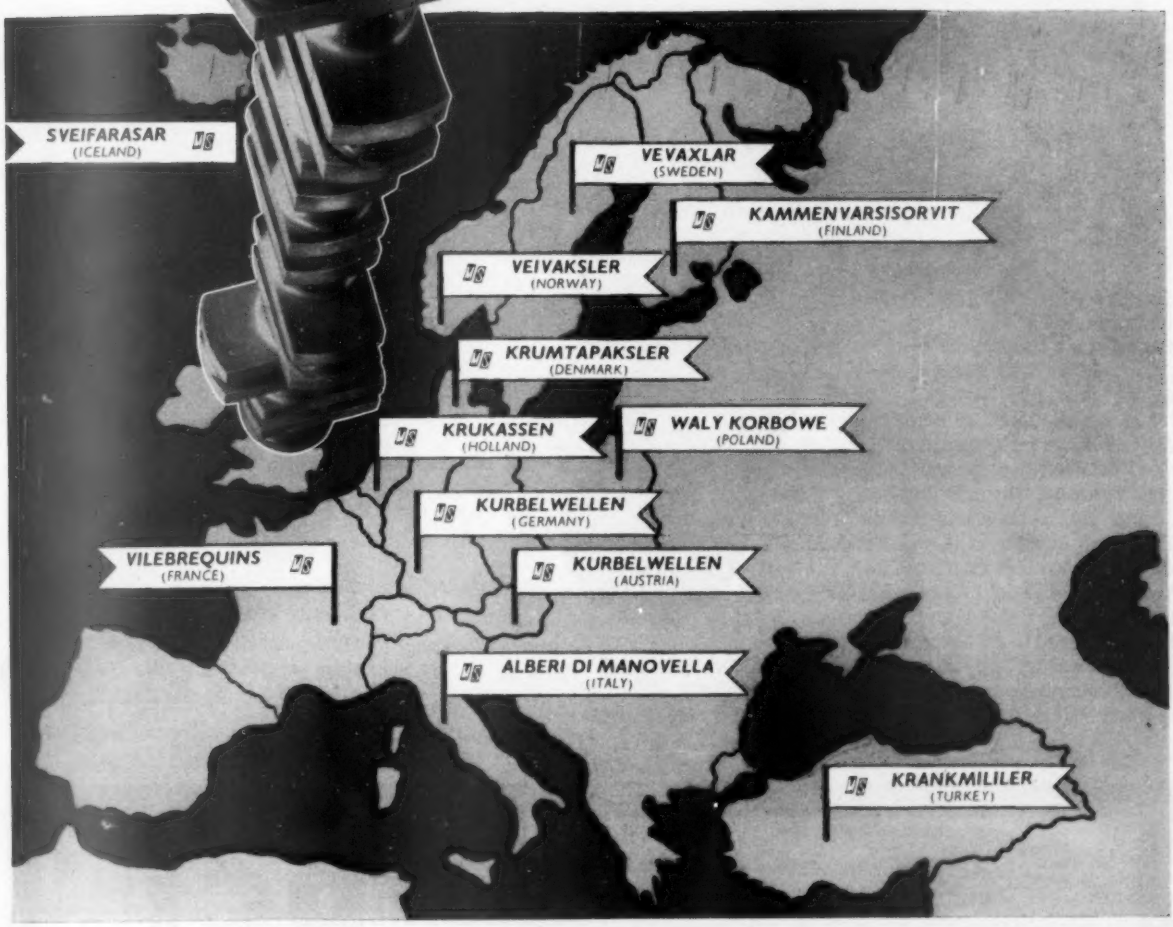
SGE SIGNALS

S.G.E. SIGNALS LIMITED
East Lane, Wembley



Airdrie signal box.

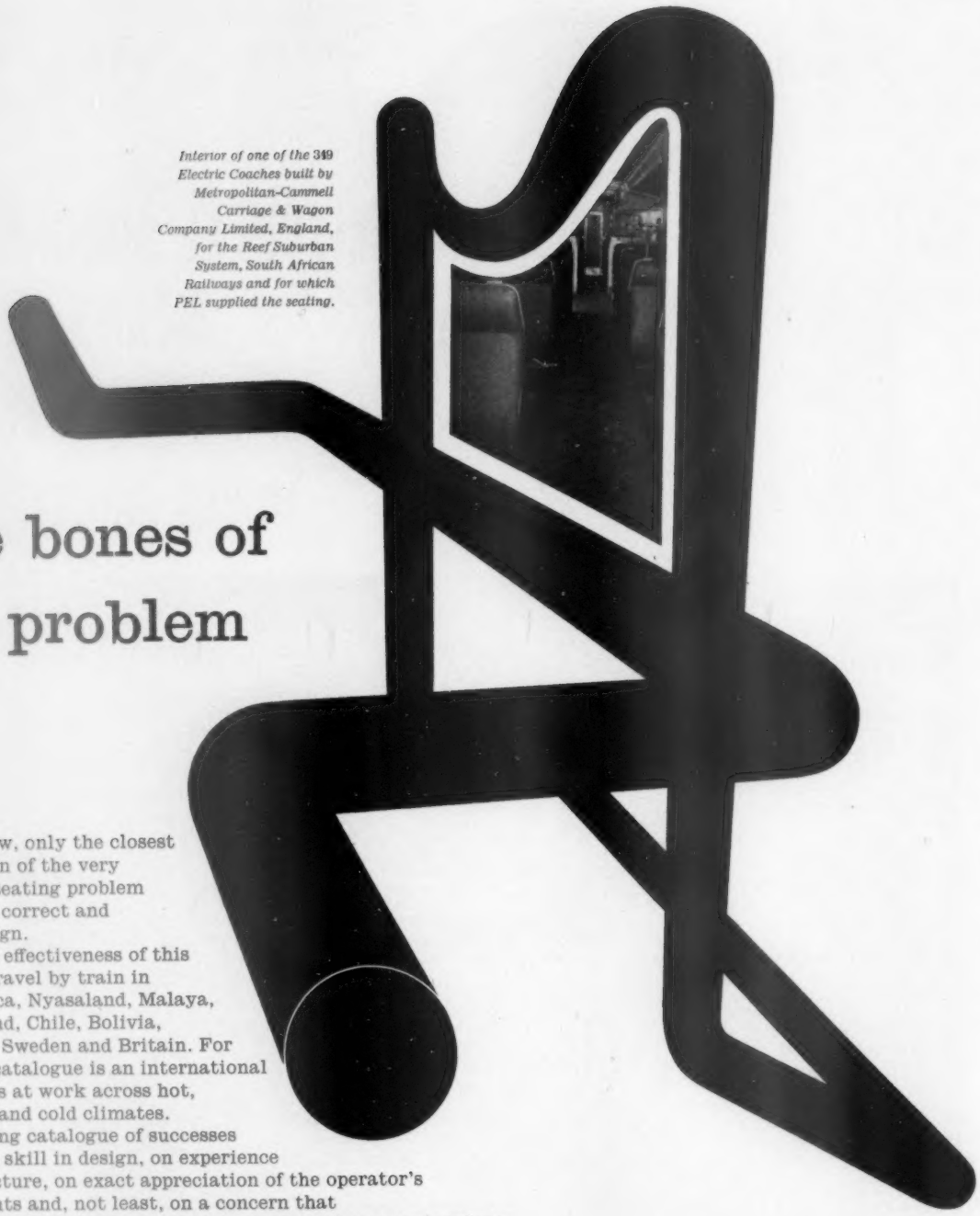
MITCHELL SHACKLETON MEANS CRANKSHAFTS in any language



MITCHELL SHACKLETON & COMPANY LIMITED

VULCAN WORKS · PATRICROFT · MANCHESTER

Associated Company : CLARKE'S CRANK & FORGE CO. LIMITED · LINCOLN



Interior of one of the 349 Electric Coaches built by Metropolitan-Cammell Carriage & Wagon Company Limited, England, for the Reef Suburban System, South African Railways and for which PEL supplied the seating.

The bones of the problem

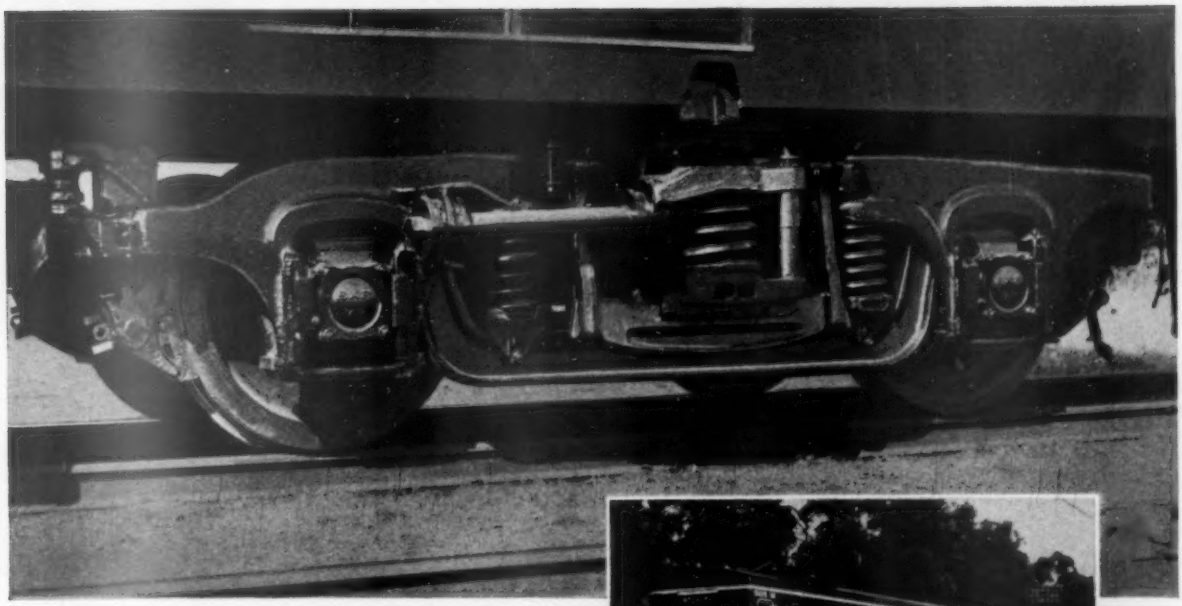
In Pel's view, only the closest examination of the very bones of a seating problem can yield a correct and logical design.
To test the effectiveness of this approach travel by train in South Africa, Nyasaland, Malaya, New Zealand, Chile, Bolivia, Argentine, Sweden and Britain. For Pel's best catalogue is an international one of seats at work across hot, temperate and cold climates.
It is a telling catalogue of successes founded on skill in design, on experience in manufacture, on exact appreciation of the operator's requirements and, not least, on a concern that seating requirements are met, and matched with economic prices.

TRANSPORT SEATING BY **PEL**

PEL LTD · OLDBURY · BIRMINGHAM · A TI COMPANY

TDW/RS 14

...where railway progress is cast in steel



Local Transit or Inter-City

COMMONWEALTH-DESIGNED BOGIES TO FIT YOUR PURPOSE

For more than 50 years, General Steel Castings has designed, furnished and service-tested Commonwealth motor bogies to meet the special demands of railways and transit systems throughout the world.

All this experience is at your disposal, to develop the particular design which will provide your system with the best in motor bogies. Each design is based on General Steel's superior one-piece cast steel frame and auxiliary components which contribute to better operation, greater passenger comfort and lower operating costs.

For *your* car building or modernization program, specify Commonwealth bogies.

Commonwealth products are furnished completely machined and are designed for all track gauges by

GENERAL STEEL CASTINGS CORPORATION

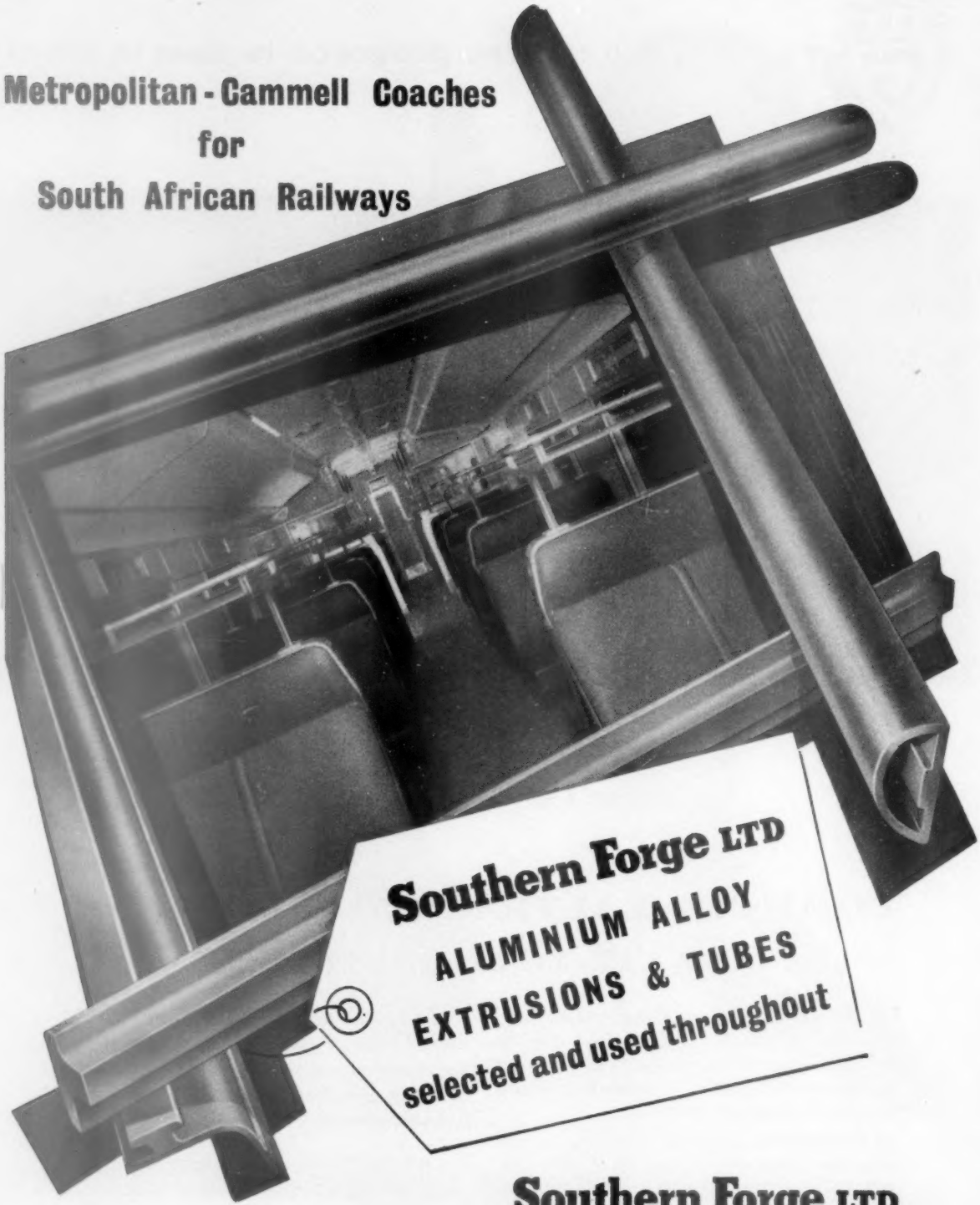
Granite City, Ill. • Eddystone, Pa. • Avonmore, Pa., U. S. A.

Commonwealth Products are produced under license in Australia, Canada, England and South Africa

COMMONWEALTH SALES CORPORATION

International Representatives: Granite City, Illinois, U. S. A., *Telegraph:* "Comsteelco"

Metropolitan-Cammell Coaches for South African Railways

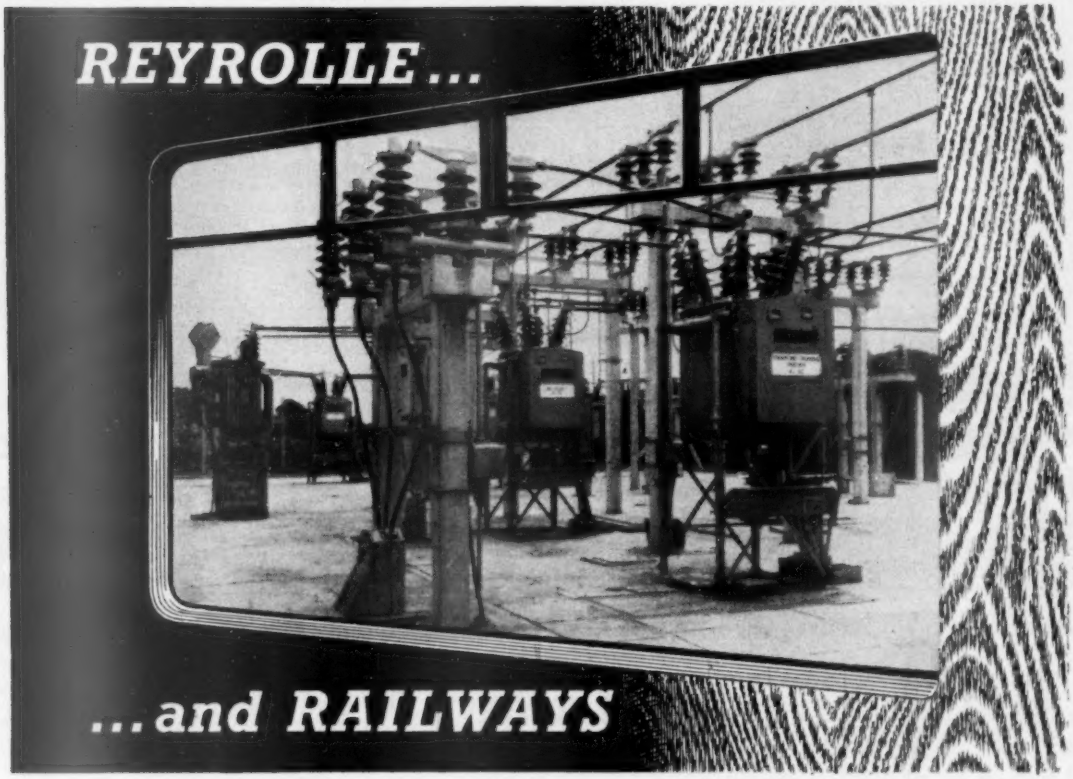


Southern Forge LTD

MEADFIELD ROAD · LANGLEY · BUCKS
Telephone: LANGLEY 301

ALMINAL W.10 alloy extrusions and tubes were selected for their lightness and modern construction and were used throughout for windows, parcel racks and interior trim.

ALUMINIUM AND
ALUMINIUM ALLOY EXTRUSIONS
TUBES AND FORGINGS



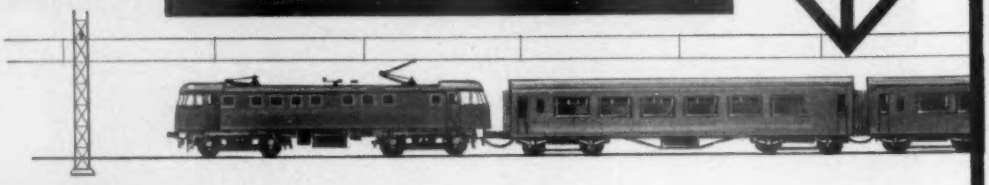
Reyrolle supplied the 33-kV 500-MVA circuit-breakers and associated equipment for the main distribution substations of the Manchester/Sheffield/Wath electrified railway.

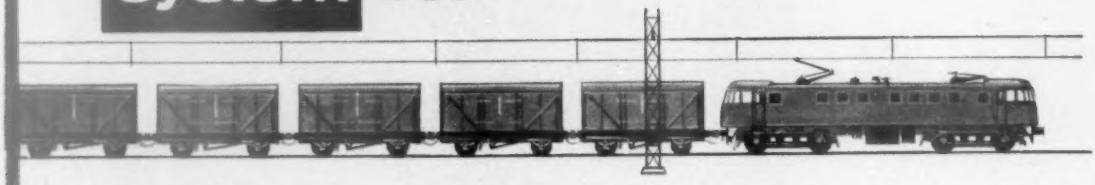
Reyrolle

ALDHAM JUNCTION · STRAFFORD CROSSING
BARNSLEY JUNCTION · DUNFORD · GORTON
NEWTON-HADFIELD · WOODHEAD
WHARNCLIFFE WOOD · NEEPSEND · ORGREAVES

A. REYROLLE & COMPANY LIMITED · HEBBURN · COUNTY DURHAM · ENGLAND

a new train describer system for British Railways

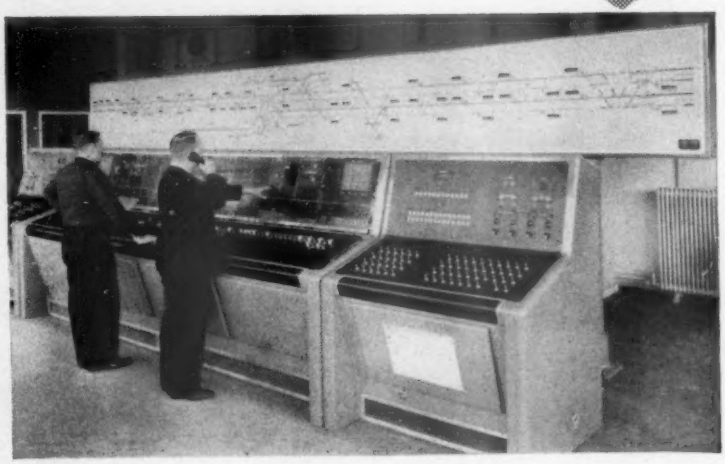




Designed and manufactured by STC as part of the electrification and resignalling of the British Railways London Midland region, this new Train Describer System has been installed to cover the busy route between Crewe and Manchester.

The outstanding feature of the system is the incorporation of the Train Describer into the track diagram thus providing an at-a-glance record of both the train description and train movements.

Descriptions are automatically transferred to successive Signal Berth Indicators in the track diagram by means of track circuits and when a signal box relinquishes control the description is automatically transmitted to the track diagram in the next box.



PRINCIPAL FEATURES OF THIS NEW **S T C TRAIN DESCRIBER SYSTEM**

- TRAIN DESCRIBER INCORPORATED INTO THE TRACK DIAGRAM.
- AUTOMATIC TRANSFER OF TRAIN DESCRIPTION
- AUTOMATIC CHECKING OF TRANSMISSION
- AUTOMATIC DISPLAY OF "UNCLASSIFIED" MOVEMENTS

STC INDUSTRIAL ELECTRONICS GROUP

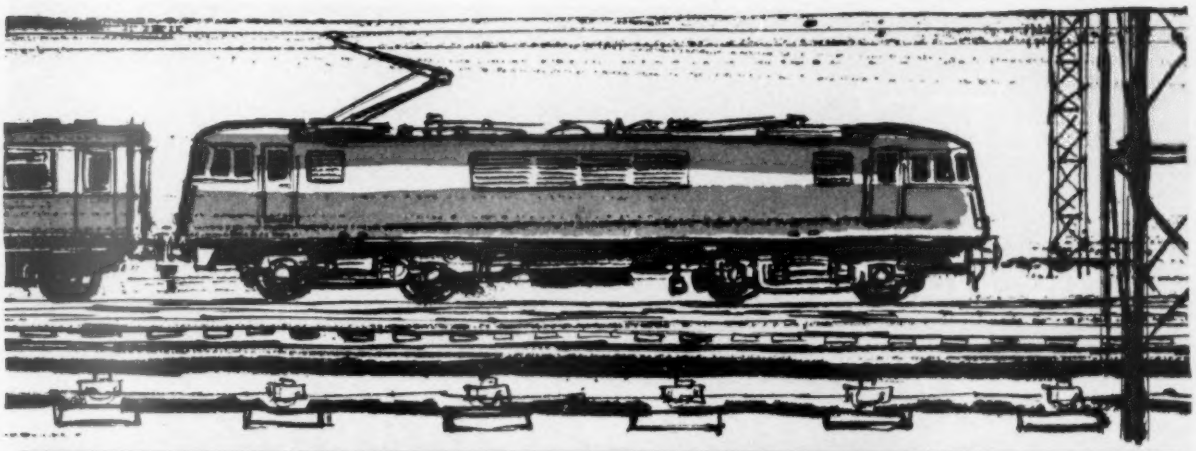
60/IR

Standard Telephones and Cables Limited

Registered Office : Connaught House, Aldwych, London, W.C.2

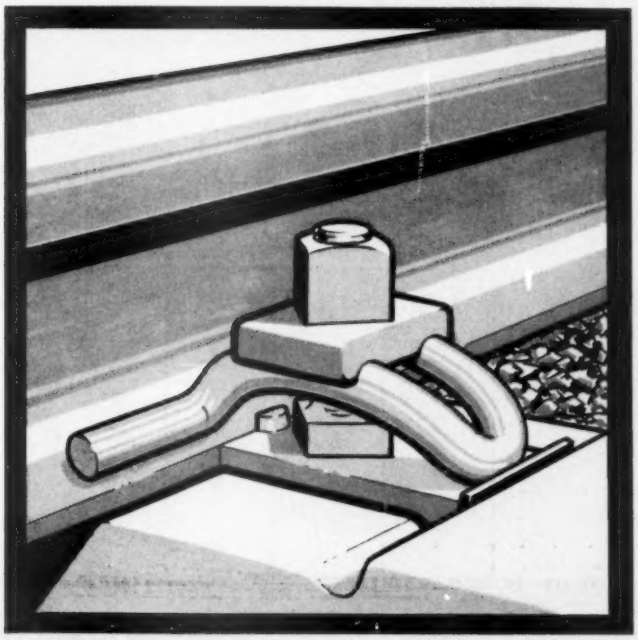
INSTRUMENTATION AND CONTROL DIVISION

PROGRESS WAY · GREAT CAMBRIDGE ROAD · ENFIELD · MIDDLESEX



KEEP TRACK

Today's 100 m.p.h. traffic makes big demands on the track. To help cope with this problem, Bayliss, Jones & Bayliss have developed resilient rail fastenings for use with concrete sleepers and long welded rails. Approved by the British Transport Commission, these tough spring steel fastenings are the latest additions to the BJB range, which still includes, of course, many traditional types of fastening.



BAYLISS, JONES & BAYLISS LIMITED

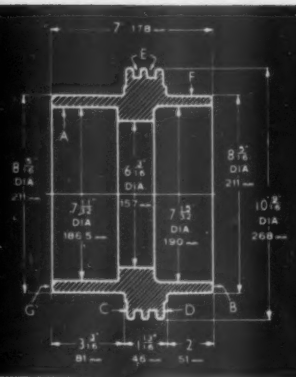
Head Office: Victoria Works, Wolverhampton. Tel: Wolverhampton 20441
London Office: GKN House, 22 Kingsway, London, W.C. 2. Tel: CHA 1616

BJB

GKN

Ward SPECIAL

TOOLING LAYOUT No. 17

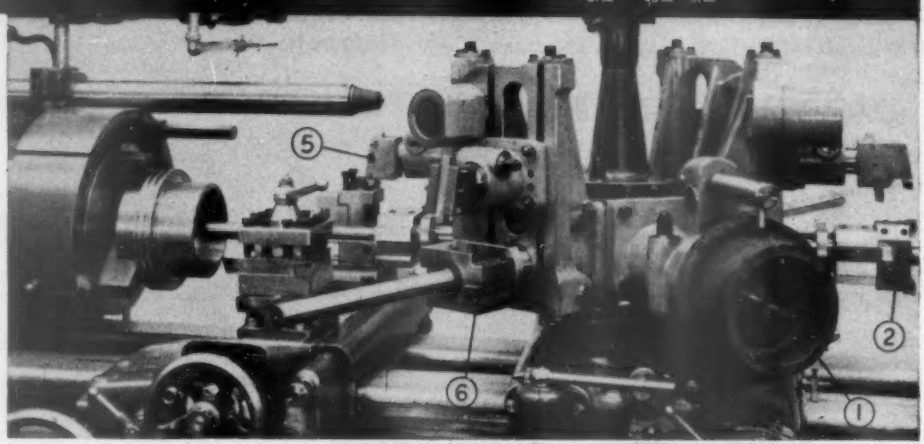


PISTON

Machined all over.

PERMALITE MALLEABLE IRON CASTING

Tungsten Carbide Cutting Tools.

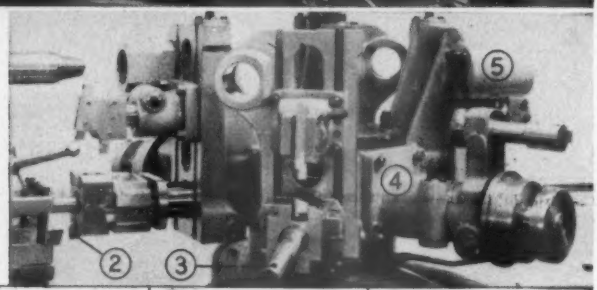


No. 8 TURRET LATHE

Code Word : **Covhylet**

Equipped with 15"—3-Jaw Tudor Chuck.

Total Floor to Floor Time : 22 mins.



DESCRIPTION OF OPERATION	Tool Position: Hex. Turret	Tool Position: Cross-slide	Spindle Speed R.P.M.	Max. Cutting Speed: Feet per min.	Max. Cutting Speed: Metres per min.	Feed: Cuts per inch	Feed: m/m. per rev.
1st Process							
1. Grip internally in "A" (using loading attachment)	1	—	—	—	—	—	—
2. Rough face "B"	—	S.T.1	102	229	69·7	98	·259
3. Rough knee turn 10 5/16" & 8 7/16" dias. and rough bore 7 11/32" & 6 1/16" dias.	2	—	84	238	72·5	136	·187
Face "D"	—	S.T.2	84	238	72·5	270	·094
4. Form grooves "E"	—	Rear	102	282	89	270	·094
5. Finish knee turn 10 5/16" & 8 7/16" dias. and finish bore 7 11/32" & 6 1/16" dias.	3	—	132	365	110·2	136	·187
6. Finish face "B"	—	S.T.2	172	375	114	136	·187
7. Remove component (using attachment)	4	—	—	—	—	—	—
2nd Process							
1. Chuck on "F" (using attachment)	4	—	—	—	—	—	—
2. Rough face "G"	—	S.T.1	102	229	69·7	98	·259
3. Rough knee turn 8 7/16" dia. and rough bore 7 1/2" dia.	5	—	102	229	69·7	136	·187
Face "C"	—	S.T.2	102	282	89	270	·094
4. Finish knee turn 8 7/16" dia. and finish bore 7 1/2" dia.	6	—	172	375	114	136	·187
Finish face "G"	—	S.T.2	172	375	114	136	·187
5. Remove component (using attachment)	4	—	—	—	—	—	—

'PRELECTOR' Combination Turret Lathes with Preselective speed-changing.

TURRET LATHES with capacities up to 35 in. swing over bed

1¼ in. to 2¼ in. 'D-S' DOUBLE-SLIDE Capstan Lathes for heavier accurate work.

Stock Tools, Toolholders, Chucks and Accessories for Capstan and Turret Lathes.

H. W. WARD & CO LTD

SELLY OAK, BIRMINGHAM 29

Phone : Selly Oak 1131

BRITISH MACHINE TOOL MAKERS ASSOC. LTD ABMTM

W690-1A

AROUND THE WORLD

OUR NAME IS RENOWNED

FOR

RELIABILITY IN RAILWAY SIGNALLING APPARATUS

AND

ALL TYPES OF GENERAL ENGINEERING

•

REGISTERED OFFICE
96 YORK WAY, KINGS CROSS
LONDON N.1

PHONE TERminus 8581
GRAMS SNALIG LONDON N.1

WORKS
FAZAKERLEY
LIVERPOOL-9

PHONE AINtree 2358-9
GRAMS SIGCO PHONE LIVERPOOL 9

REPRESENTATIVES IN

SOUTH AFRICA, AUSTRALIA, NEW ZEALAND,
CHINA, URUGUAY, BRAZIL, EGYPT, ARGENTINE AND GREECE.

C*

SYLGLAS OVERHEAD !

Sylglas glazing and sealing tape is used to seal the roofs of many of Britain's well-known factories and buildings:— The Royal Albert Hall, Stanton Iron Works, Rowntrees factory, Vandervell Products works — all have been weather-proofed by Sylglas. British Railways have also applied it to many stations.

The larger the roof area, the greater the weather-proofing problems . . . and more urgent the need for Sylglas. Easy-to-apply Sylglas is 100% waterproof. It is the most economical way of sealing any roof permanently, does not peel off or crack and remains unaffected by vibration.

If the weather is playing havoc with your roof, get Sylglas Tape. We will be happy to advise you on your particular problem.

SYLGLAS Regd. GLAZING AND SEALING TAPE

THE SYLGLAS COMPANY, 81 KNIGHT'S HILL, WEST NORWOOD, LONDON, S.E.27.
Telephone: GIPsy Hill 7511 (10 lines) Telegrams: Snowwhite, London, S.E.27.

"TAKE MY TIP— USE SIFBRONZE WELDING EQUIPMENT!"

says Will the Welder

"DEMON" BLOWPIPES
General Duty and Cutting Models.

SIF-COLIBRI CUTTING MACHINE
The clockwork machine which turns a hand cutter into a precision machine cutter. Ideal for flame cutting on site.

SIF-COMBI PROFILE CUTTING MACHINE
An automatic dual purpose machine for all kinds of cutting work.

SIFBRONZE REGULATORS
Modern precision instruments giving constant pressure and volume.

SIFBRONZE CATSEYE GOGGLES
The most advanced type on the market.

If you want to know how Sifbronze equipment can help you fill in the coupon right away

To SUFFOLK IRON FOUNDRY (1920) Ltd., Stowmarket, Suffolk.
Please send me leaflets detailing Sifbronze equipment.

NAME.....

ADDRESS.....

.....

ER/6/1

KENITRA

Track Maintenance Equipment

V.V.2 COILS. *In Service on Main Lines throughout the World.*

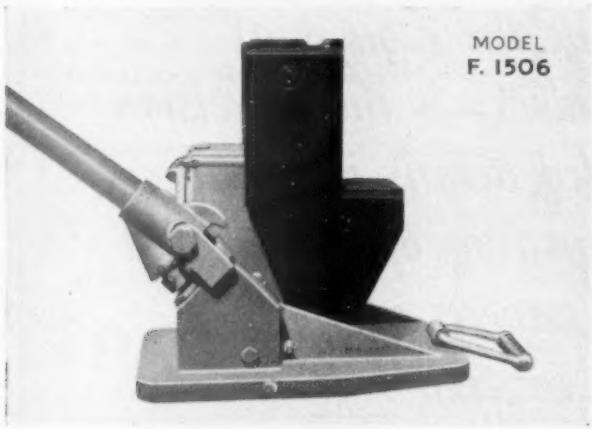
VV

FLY SPANNERS AND SPIKE TENSIONERS.

KENHI

"MINI" TRACK JACK and Complete Range of HYDRAULIC TRACK JACKS AND TOE JACKS

There is a detailed, illustrated Booklet for each one of the above "Kenitra" products.



MODEL F. 1506

'KENHI' HEAVY DUTY TRACK JACK

This hydraulic jack is specially designed for use in the maintenance of switches and crossings, and for track renewals. It has all the needed capacity for lifting the heaviest lay-out.

Capacity: 20 tons on the head; 15 tons on the toe. Hydraulic lift 6".

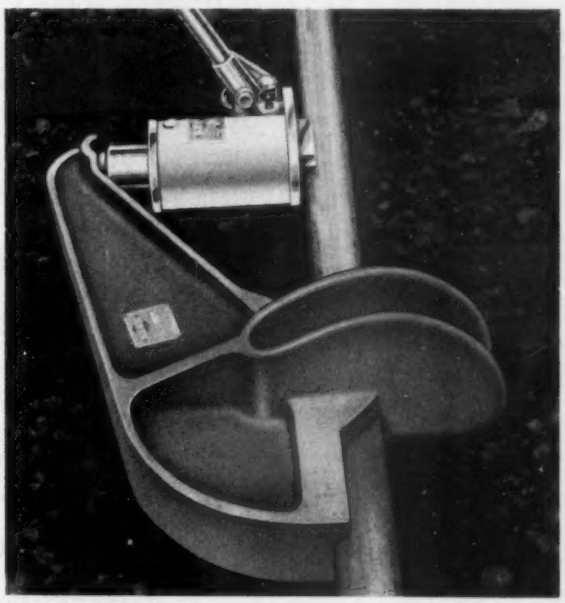
KENHI MODEL S.2541

HYDRAULIC

RAIL BENDER

The Lightest of its kind

Can be Operated and removed from the rail within seconds by one man



This "Kenhi" Rail Bender is suitable for Bull Head or Flat Bottom rails up to 109 lbs. per yard.

Many urgent jobs which hitherto could not be tackled on the site can now be done by this lighter and safer tool.

It is ideal for straightening crippled rails and putting the set in switches or stock rails, etc.

Write for detailed illustrated booklet to:

KENITRA COMPANY LIMITED

54 OLD BROAD ST., LONDON, E.C.2

Telephone: LONdon Wall 7621

Confidence in the future...

is the theme of 37 senior railway executives in all parts of the world who write in

OVERSEAS RAILWAYS 1960

A special feature this year—supplied at the request of many readers—is the provision of extended details in tabular form regarding operating and financial aspects of the railways covered

A RAILWAY GAZETTE PUBLICATION
issued by TOTHILL PRESS LIMITED
33 Tothill Street, London, S.W.1

Price Seven Shillings and Sixpence — By post Nine Shillings and Sixpence

CONVEYANCER—SCOTT

Electric Trucks and Tractors

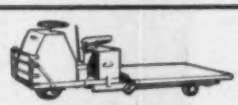
New Additions to the Conveyancer Range . . . Scott Electric Vehicles . . . towing tractors, elevating and fixed platform trucks . . . Electronically controlled "Robotug" systems . . . The Scott electric truck in all its various forms is being used extensively throughout Great Britain . . . in station sorting offices of the General Post Office, in goods and passenger stations of British Railways, in factories and in hospitals. Write for illustrated literature.

ELECTRIC INDUSTRIAL TRACTOR

ELECTRIC FIXED PLATFORM TRUCK

ELECTRIC HORSE (LOW OR HIGH PICK-UP MODELS)

ELECTRIC PLATFORM TRACTOR



ELECTRIC LOW LOADER ELEVATING PLATFORM TRUCK AND LOW LOADER FIXED PLATFORM TRUCK

Conveyancer-Scott ELECTRIC VEHICLES LTD.
LIVERPOOL ROAD, WARRINGTON
Telephone: 35241. Grams: Hydraulics, Warrington.

Contractors to
H.M. Government, British and Foreign Railway and Tramway Companies for 85 years.

AXLE BOX PACKINGS

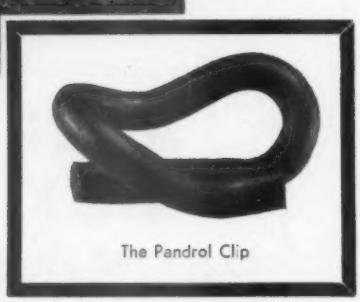
E. ILLINGWORTH & Co. (BRADFORD) Ltd.
SHELF MILLS, SHELF, Nr. HALIFAX, YORKS.

WOOL LUBRICATING AND SYPHON YARNS
THERMAL AND SOUND INSULATING FELTS
ILLMOND NEEDLELOOM CARPETING
AIR FILTER PADS—COTTON WOOL

Telephone:
Bradford 76261-9
Telegrams:
Illmond Bradford

THE PANDROL RAIL FASTENING

Reproduced by courtesy of British Railways



The Pandrol Clip

The Pandrol Clip

provides an efficient and economic resilient fastening between rail and baseplate. It resists rail creep in both directions and is easily driven and removed with a hammer. It is suitable for use with wood, concrete or steel sleepers.

LOCKSPIKE LTD 41/43 MINCING LANE · LONDON · E.C.3
Tel: MINcing Lane 3222 · *Cables: Lokspike, London*

The
RAILWAY GAZETTE

INCORPORATING: THE RAILWAY ENGINEER • TRANSPORT • THE RAILWAY NEWS • THE RAILWAY TIMES • RAILWAYS ILLUSTRATED
HERAPATH'S RAILWAY JOURNAL (ESTABLISHED 1835) • THE RAILWAY RECORD • THE RAILWAY OFFICIAL GAZETTE

A journal of Management, Engineering and Operation

VOL 114 FRIDAY APRIL 14 1961 No. 15

CONTENTS

	PAGE
Editorial notes	409
The Gotthard line	411
Management development	412
Southern Region summer services	412
Malayan Railways	413
British Transport Commission traffic receipts	413
Letters to the Editor	414
The scrap heap	416
Overseas railway affairs	417
Publications received	418
Automatic signalling for Melbourne-Albury standard-gauge line	419
Longest railway lift-span bridge constructed over New York Harbour	420
Hydro-mechanical transmission for dual-purpose locomotives	421
Carrying iron ore on the Vitória-Minas Railway	424
Personal	425
New equipment and processes	427
Rand Show, Johannesburg	430
News articles	432
Contracts and tenders	433
Notes and news	434
Railway stock market and official notices	436

Editor: B. W. C. Cooke, Assoc. Inst. T.

33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

Telephone: WHitehall 9233 (24 lines) Telegrams: "Trazette Parl London"

BRANCH OFFICES

GLASGOW: 139, Bothwell Street, C.2 ... ... *Central 4646*
NEWCASTLE-UPON-TYNE: Cathedral Buildings, Dean Street, 1 *Newcastle-upon-Tyne 22239*
MANCHESTER: Century Insurance Building, St. Peter's Square *Central 7647-8-9*
BIRMINGHAM: 90, Hagley Road, Edgbaston ... *Edgbaston 2466—3728—3732*
LEEDS: 70, Albion Street ... ... *Leeds 27174*
BRISTOL: 20, Victoria Square, Clifton ... ... *Bristol 33873*

Annually £5 by post Single copies, two shillings
Registered at the G.P.O. as a newspaper. Entered as second-class matter in U.S.A.

The need for exports

VIGOROUS backing to the Government policy of greater sales overseas is contained in the "Economic Survey for 1961." This document, which forms the basis for budgetary and economic policy of this country, states that for a country in the international position of the United Kingdom, it is axiomatic that growth of the economy must be interlocked with that of exports, otherwise the balance of payments situation is bound to frustrate growth and force a reversal of direction. The Survey states categorically that endeavours of Government and industry to foster the growth of the economy will succeed only if they are also designed to improve the country's competitive power. Growth and competitiveness can never be separated. For this year the Treasury predicts that United Kingdom exports may be expected to benefit from any expansion of world trade, but it warns that this will happen only if they are competitive in price and delivery and if salesmanship is sufficiently vigorous. During 1961 the Survey expects that there may be a decrease in imports arising, in part, from an expected reduction in the rate of stock-building, but any substantial improvement in the balance of payments position must rest on expansion of exports. This will depend in part on the level of world trade, but much more on competition in prices and the maintenance of deliveries, as well as on initiative in expanding existing and developing new markets. There can be no doubt that the statements in the "Economic Survey" are well-founded and that the need for increasing this country's export of capital, as well as of consumable goods, is basic to any true improvement in the country's economic position. It is equally true that competitiveness in overseas markets must be linked to the price of the final product in comparison with that of other exporting nations. That price must reflect a variety of home costs, of which that of labour is generally predominant. Inherent in the appeal by the Treasury is the need for capital, management, and labour to co-operate in ensuring that the competitive position of the manufacturing industry of this country does not fall below that of other industrialised states.

British Transport advertising

THE future of the British Transport Commission's commercial advertising service has been in doubt since the issue of the Government's White Paper last December setting out its views on the reorganisation of the nationalised transport undertakings. In our January 6 issue we suggested that this efficient commercial enterprise should retain the corporate constitution which has proved so successful. It has now been announced that, in pursuance of the Commission's policy of decentralisation and in view of the importance of the commercial advertising service, British Transport Advertising has been established as a separate division under a Board of Management. The Chairman of the board is Mr. J. H. Brebner, who recently retired from the position of Public Relations Adviser to the Commission, and the members are Mr. George Dodson-Wells, Chief Commercial Advertising Officer, Mr. J. L. Perren, Commercial Advertising Officer, and Mr. H. W. Denham, Accountant. British Transport Advertising annual receipts have established records for two years in succession and they are currently running at the rate of £3,600,000. They amounted to £2,900,000 during the first full year of business after the railways were nationalised.

Rhodesia Railways closes London office

AS PART of the general re-organisation of Rhodesia Railways, that system will close its London office on June 30 this year, and with minor exceptions, the work now being done in that office will be transferred to Rhodesia. It is estimated that this move will result in an annual saving of about £17,400 and that benefit will accrue to the Federation of Rhodesia & Nyasaland in that there will be a tendency for manufacturers' agents to establish themselves in the Federation. Most of the work now undertaken by the office in London is connected with the purchase of stores and equipment and the railway further believes that, with the growing supply of railway materials

from within the Federation and from neighbouring countries, the existence of a buying organisation in London is not as necessary now as formerly. It is thought that direct contact with British suppliers can be adequately maintained by airmail services and telephonic communication.

L.A.M.A./C.O.I. exhibit at Johannesburg

ELSEWHERE in this issue will be found illustrations of the rail-transport exhibit at the Rand Show. The organisers, the Locomotive & Allied Manufacturers' Association of Great Britain and the Central Office of Information, may well be proud of their work, which was awarded a gold medal in a show where the standard was exceedingly high. Public interest was such that no fewer than 523,000 attended in the relatively short time the exhibition was open. The railway supply industries displayed many of their latest products, which in addition to being of interest to the main-line railways of the African continent are also supplied to industrial undertakings. The South African market constitutes a most important one, and the opportunity accorded to potential users of equipment to examine it at such an exhibition cannot fail to benefit purchasers and exhibitors alike. Particular satisfaction results when the organisation is as well carried out as it was in this instance.

Schoolboys' study courses

AN INDUSTRY offering a rewarding and interesting career must attract the right material and demonstrate clearly just what it has to offer. The short study courses conducted by the North Eastern Region of British Railways for public and grammar school boys, with the co-operation of the Public Schools' Appointments Bureau and the Ministry of Labour, are an admirable way of doing this. By giving boys an insight into modern railway practice by demonstrations, lectures, film shows, and visits to new installations the courses will arouse enthusiasm and go far to attract young recruits anxious to learn more. Nothing will be lost, even if some of the boys ultimately decide not to pursue their careers with the railways, for they will take with them into their alternative careers lasting impressions of a vigorous and energetic industry rapidly regaining its leadership in the world of transport.

B.I.M. overseas conference

"INDUSTRIAL growth in developing countries" will be the theme of a British Institute of Management conference to be held at the Metropole Hotel, Brighton, on April 26 and 27. Sir John Elliot, Director of the Commonwealth Development Corporation, will open the conference and papers will be given by Mr. R. G. Searight, Shell International Petroleum Co. Ltd.; Mr. K. D. Brough, Managing Director, Metal Box Co. (Overseas) Ltd.; Mr. E. M. Hyde-Clarke, Director, Overseas Employers' Federation; Mr. John Marsh, Director of the Industrial Welfare Society and, from October 1, 1961, of the British Institute of Management ; Dr. M. F. Garcia, President of Motores Perkins S.A., Brazil; Mr. M. I. Prichard, Managing Director of F. Perkins Limited, and Mr. P. G. H. Lewison, head of the Personnel Department of British-American Tobacco Limited. The conference will be reviewed by Mr. William Clark, Director of the Overseas Development Institute, and the Chairman will be Mr. Peter Parker, Director, Booker Bros., McConnell & Co. Ltd. Sir Eric Harrison, High Commissioner for Australia, will be the principal speaker at the closing dinner on April 27.

Car-sleeper trains

ONE modern railway development for which Great Britain can claim credit is the car-sleeper service for motorists. The original Kings Cross—Perth and Marylebone—Glasgow trains have been gradually augmented, and now the Midlands have their Sutton Coldfield—Stirling train and the North Eastern Region services from Newcastle and York to both Inverness and Exeter, while motorists to the Continent are catered for by car-sleeper trains from Newcastle and Manchester to Dover, connecting there with the car ferry to Boulogne. The mainland of Europe also now is criss-crossed by an extensive pattern of "auto-couchette" trains, which incorporate sleeping cars for both classes of passenger, couchettes, and a refreshment service or restaurant car. Additions in the coming summer are to be thrice-weekly services between Paris and Biarritz and a bi-weekly train between Paris and Milan, while the once-weekly service between Avignon and Amsterdam is to be doubled, running alternately to and from Amsterdam and Düsseldorf. These trains show admirably how rail can co-operate with road to the advantage of both.

Rolling-stock order transfer

ACCORDING to a joint statement made last Friday by the London Transport Executive, the Birmingham Railway Carriage & Wagon Co. Ltd., and the Metropolitan-Cammell Carriage & Wagon Co. Ltd., London Transport has agreed to release the Birmingham Railway Carriage & Wagon Co. Ltd. from its contract to supply 450 Underground cars for the renewal of rolling-stock on the Central and Piccadilly lines. Arrangements have been made for the cars to be manufactured by the Metropolitan-Cammell Carriage & Wagon Co. Ltd., which is in a position to effect delivery at the time required, beginning early in 1962. These changes in the arrangements for the manufacture of the cars will involve London Transport in virtually no additional cost. The Metropolitan-Cammell Carriage & Wagon Co. Ltd. is at present engaged in the manufacture of 589 cars for the Piccadilly and Central lines under an earlier order, and delivery of these is in progress.

Sharing scientific equipment

AN INDICATION of the increasing importance being placed by industry on co-operation is given by the news that a scheme has been instituted for sharing scientific equipment betweeen companies in South-East England. It is believed to be the first arrangement of its kind in England and Wales if not in the United Kingdom. Many of the 126 industrial concerns represented in the Region's Research Directors' Discussion Group have submitted lists of items of equipment they are prepared to make available to other companies and to which they would like to have access. These lists are now being circulated to all members of the group, with the suggestion that prospective lenders and borrowers should get in direct contact. It is hoped that other companies will be moved to participate in the scheme as a result of this initial circularisation. The idea arose from a suggestion put forward by a member of the group.

London Transport inquiry urged

A DEMAND for an immediate public inquiry into the transport services of Greater London was made by a committee of the Home Counties Liberal Federation in an interim report published last week. One of the main recommendations was that London Transport's monopoly should be modified. It was thought that, where bus services run by the L.T.E. meet with competition, the result has been a lowering of fares charged by the Executive. While it might not be practicable to revert to free competition in the central area, such objections would not apply to outer areas, and it was recommended that, where a service is demanded and London Transport cannot or will not provide it, the route should be put out to tender to private operators. Other recommendations included proposals for higher pay for London bus drivers and conductors; an immediate start on the Victoria Underground line; a continuous

survey of London traffic, and the formation of a consultative committee.

Good performance by Victorian Railways

DURING the four weeks ended January 31, Victorian Railways achieved a record movement of wheat, when the system loaded over 19,000 wagons. Response from users was immediate and appreciative: praise was received from the Grain Elevators Board, Noske Flour Mills Pty. Ltd., and the Shire Secretary of Warracknabeal. The railway did not rest on its laurels. It made immediate preparations for another mass transport task, that of moving the superphosphate traffic. To cope with this, 20 additional freight trains have been put on each week on five lines in mid and Western Victoria. The trains will run until mid-May, when it is expected that the majority of superphosphate orders will have been delivered. To expedite wagon-emptying by users, demurrage charges are being applied to wagons held over permitted times at country stations. This measure should ensure that farmers give the maximum co-operation: wagons that are not emptied quickly will prevent another customer from getting expeditious service.

Goods train timetable conference

DELEGATES from all railway administrations in Europe except the U.S.S.R. and from the International Union of Railways arrived in London on April 12 and will remain until April 19 for the European Goods Train Timetable Conference. This conference, which is held every Spring and Autumn in various European cities, last took place in London in 1952. Its object is to review the details of goods train movements throughout Europe to see how services can be accelerated, how delays at frontiers can be reduced, and to explore other improvements. It will be held at the Mayfairia Rooms, Bryanston Street, W.1, and will be opened by Mr. J. L. Harrington, Chief Shipping & International Services Officer of the British Transport Commission. Delegates will spend Sunday, April 16, in the Shakespeare country, and there will be a dinner at the Abercorn Rooms, Great Eastern Hotel, Liverpool Street, on April 18, at which Mr. H. C. Johnson, General Manager of the Eastern Region of British Railways will preside.

Reorganisation of Chiswick works

LONDON TRANSPORT'S works at Chiswick deal with bus and coach overhaul, and as such might be thought to have little or no interest to railway engineers. In fact, because of the affinity of the modern bus engine and many engines fitted to multiple-unit railcars, there is much which can be profitably studied. The works have recently been completely redesigned and reorganised on modern flow-production lines. The system, developed over many years, permits full control of the inspection and progressing of work throughout the shops and segregates operations in a manner which facilitates rate-fixing as far as this is possible. A review of the engine work carried out showed that an overhauled engine of a selected type contained 20 per cent new parts, 63 per cent reconditioned parts, and 17 per cent parts which needed no more than cleaning to make them serviceable. Further reference to the procedures employed will be made in a forthcoming issue.

Differential hydraulic transmission

A 600-h.p. diesel locomotive incorporating a novel combination of hydraulic and differential transmission has been designed and built by the Yorkshire Engine Co. Ltd. in collaboration with Rolls-Royce Limited. The purpose of the design has been to produce a locomotive of high tractive effort for heavy shunting, combined with a top speed of 36 m.p.h. for transfer or trip-working, operating at maximum economy throughout the speed range. Two engines are installed in opposed positions on the locomotive on either side of a central cab, each driving through a torque converter into a differential gearbox. The full tractive effort for starting and for shunting is obtained on one engine only. For trip-working, the second engine may be engaged or disengaged at any speed between 4 and 12 m.p.h., the change being effected without break in torque and without manual gearchanging. A review of this locomotive is given elsewhere in this issue.

C.P.R. controls new 4,800-mile Soo line

The merger dating from December 30, 1960, of the former Soo Line (The Minneapolis, St. Paul & Sault Ste. Marie) (3,222 route-miles), the Wisconsin Central (1,031 route-miles), and the Duluth, South Shore & Atlantic (543 route-miles) Railroad Companies, has produced the new Soo Line Railroad Company's system nearly 4,800 route-miles in length. The Canadian Pacific Railway owns the majority of shares in the new company, and so has a controlling interest. It is estimated that the merger will effect a saving of about $1,260,000 a year, and the number of Directors is being reduced from 28 to 19, by reducing the number elected at each successive annual meeting. The new Soo system extends from Chicago in the south and Sault Ste. Marie in the east to eastern Montana and the Canadian border in North Dakota and Minnesota. By being better able to compete for business from a more secure financial foundation, the new concern should show further economies and profits within a period of about four years.

Locomotive availability in Rhodesia

CONSIDERING differences in altitude of 2,500 ft. and in temperatures, excellent mileages are being attained by locomotives on the Rhodesian Railways. By completing 20 round trips each of 686 miles during the month ended January 1, 1961, English Electric diesel-electric locomotive No. 1208 not only achieved a monthly overall total of 14,062 miles but also hauled 14 million ton-miles of traffic in normal working without special treatment. It must be remembered that this mileage is not so greatly in excess of that previously recorded by a Garratt steam locomotive No. 379 in similar circumstances. Diesel No. 1208's figures were also closely approached by others of its class in similar working of pick-up goods, through goods, and mixed passenger trains between Bulawayo and Malvernia. Its fuel consumption was about 25,000 gal., and only 160 gal. of cooling water were used; out of the 744 hr. in the month this engine was available for 694 hr.

The Gotthard line

ONE of the most important and heavily-trafficked main routes in Europe is the Gotthard line of the Swiss Federal Railways, and a great deal of work is in hand or scheduled to increase its capacity. The biggest task is at the Swiss-Italian frontier station of Chiasso, which with its yards is being greatly enlarged and reconstructed. Over 13 miles of new yard tracks are being provided, half of which are in position. New covered platforms and a shed 390 ft. x 130 ft. for customs examination are already in use. Access lines are being laid from both Italian and Swiss sides, the latter involving the boring of a tunnel 1,800 ft. long at Balerna. Additional tracks 5 to 8 inclusive are complete in the passenger station, and are equipped with current conductors for both the Swiss 15,000 V. a.c. and Italian 3,000 V. d.c. Improved signalling will provide for non-stop running through Chiasso, for the first time on record, of the new T.E.E. trains "Gottardo" and "Ticino" from July 1 next.

At Basle, at the northern frontier, an extension is being laid out alongside Muttenz marshalling yard. On its completion the tracks at Pratteln, where the Zurich and Olten lines

separate (the latter carrying the Gotthard line trains), are to be rearranged to facilitate the movement of trains. The Muttenz extension will handle international freight traffic. Another track rearrangement under consideration is at Emmenbrücke, just north of Lucerne, where the Gotthard line is joined by the lines from Basle and Berne, resulting in very dense passenger train movement between Emmenbrücke and the terminal station at Lucerne.

The reconstruction of Göschenen Station, at the north portal of the Gotthard tunnel, is practically complete. An island platform has been built, with subway access, and the freight yard has been considerably enlarged. Because of limited space in the narrow valley, a second tunnel has been bored parallel to the existing tunnel for about ½ mile. This will house the shunting necks at the south end of the station. One of the lines has been prolonged to join the southbound main line in the tunnel.

Congestion through the tunnel is due in part to the great increase in the number of motorcars now carried between Göschenen and Airolo, for the handling of which special facilities have been established at both stations. About 25 trains are advertised daily in each direction for motorcar transport, and at times like Easter, when the Gotthard Pass is still closed by snow, this number may be considerably increased.

Before the line was built from Lucerne to Immensee, the original Gotthard line ran from Rotkreuz, on the Lucerne-Zurich line, to Immensee. This still forms part of a direct route from Basle to Arth-Goldau, via the east curve at Olten, Aarau, Lenzburg, and Wohlen to Immensee, which is used by all the heavy freight traffic, and also by the important night " Italia Express " and " Riviera Express " sleeping car services, which have no publicly-advertised stop between Basle and Bellinzona. Hitherto, this line has been single-track between Wohlen and Immensee, but doubling between Rotkreuz and Immensee is nearly complete, and will be followed by doubling from Wohlen to Rotkreuz. Automatic signalling also is to be installed between Immensee and Arth-Goldau.

A further contribution to increasing line capacity is the locomotive-building programme described in our February 10 issue. The new 5,600 h.p. Bo-Bo locomotives are to take over passenger services, releasing more of the 6,000 h.p. Ae 6/6 Type Co-Co locomotives for freight service; the existing 50 of this class are to be supplemented by a further 24, which will be completed by 1964. These locomotives are designed to maintain a speed of 75 km.p.h. (46 m.p.h.) up the continuous gradients of 1-in-38½/40 to the Gotthard tunnel, and the intention is to use the Ae 6/6 Type in pairs of 1,200 h.p., with multiple-unit control. which will thus make possible the working of 1,200-ton freight trains, so greatly easing the line occupation problem.

Management development

MANAGEMENT becomes more complex daily and the urgency and seriousness of the need for management equipped to contend successfully with the many problems of industrial economy can scarcely be challenged. To assist in meeting this need Mr. George N. Daffern has written a book,* which is of particular interest in that it owes its origin to a resolution passed by the Railway Progress Institute in New York in 1956. The author is well qualified to deal with his subject for, in addition to his specialised knowledge of it, he has a background of railway experience.

The world is a rapidly-changing place, and change always presents challenge. To meet this challenge industrial leaders will need all their intelligence, ingenuity, imagination, and, Mr. Daffern suggested, perhaps most important of all, concern for human welfare. Attention to the last-mentioned aspect, as indeed with all other items of management, must be reflected in the welfare of the organisation.

Among the factors which are listed as being requisites of better management is performance appraisal ; more than half of the book is devoted to the evolution of a performance appraisal procedure, the facets of purpose, method, results, and management inventory all being considered in their many aspects.

Purpose devolves from the fact that management development on railways has perforce to be realistic. There is little or no cash in the till to follow fashion or indulge in fads or fancies. Management development has to be essentially a matter of finding out what is the total leadership job needed to ensure survival and what improvements are necessary to get that job done properly. This definition pertinently sums up the problems facing Dr. Beeching from June 1. Top management rightly expects much of its supervisors and they, in turn, expect even more from top management. While some of these expectations might be regarded as so obvious that they do not warrant attention it is extraordinary that they are still neglected. We have in mind the subject of communications : clear, concise and unobstructed lines of communication, up, down, and across, are by no means universal either in railways or other industrial organisations.

Appraisal procedure has not always proved as beneficial as hoped for, and the basic purpose – to improve performance – has not been accomplished sufficiently. Basic reasons for comparatively poor results of performance appraisal procedure, when applied to a railway, resulted from misapplication. Examples of the mistakes made were : the neglect of performance for psychology, basing the procedure on the misconception that the average manager is able to appraise his subordinate's performance accurately, without that subordinate's assistance, and focusing on an individual's weaknesses rather than on his strengths. It would appear that when initiating a performance appraisal procedure the first thing to appraise is the procedure. In this connection Mr. Daffern's book gives much valuable guidance.

The results of performance appraisal, as applied to the operating and traffic departments of a railway are illuminating. Many of the points listed are those which would automatically be dealt with by any enlightened management, with or without the benefits conferred by performance appraisal as it is now understood. We may digress here to reflect that appraisement has been taken in their stride by many competent managers without the application of a label. This is not to say that they cannot profit from studying this book, which drives home fundamentals apt to be overlooked in some quarters. As an example there is a reminder that a job has only one reason for existence, and that is that it is indispensable to the customer.

Top management is only too well aware of the increasing magnitude of its difficulties and while the answers to many, or even most, of its complex problems are not to be found within the covers of a book, that under review is a valuable contribution to the thinking of corporate executives on a problem of common concern.

Southern Region summer services

IN the summer timetable of the Southern Region, which will come into operation on June 13, the most important changes are those relating to the Channel Islands steamers. As compared with last summer, there will be no sailings from or to Southampton, but the entire service will be concentrated on Weymouth. The boat train for the day service will leave Waterloo at 8.10 a.m., Sundays included (5 min. earlier on Saturdays), reaching Weymouth Quay at 11.40 a.m.; the steamer will sail at 12.30 p.m., and reach Guernsey at 4.30 p.m. and Jersey at 6.45 p.m., 1 hr. earlier than in 1960. From June 16-17 to September 8-9 inclusive there will be a night service on Fridays and Saturdays at 9.15 p.m. from Waterloo, reaching Weymouth Quay at 12.52 a.m.; with a steamer departure at 1.30 a.m., Guernsey will be reached at 6 a.m.

* "*Management Development in a Changing World*," by George N. Daffern, Simmons-Boardman Publishing Corporation, New York. $4.00

and Jersey at 8.15 a.m., also 1 hr. earlier than by last summer's service via Southampton. On Fridays and Saturdays from June 30-July 1 to August 25-26, there will be a relief night boat to Jersey only, with a connecting train from Waterloo at 7.45 p.m., and a Jersey arrival at 6 a.m.

In the reverse direction, the day departure will be from Jersey at 9 a.m., and Guernsey at 11.15 a.m., with a Waterloo arrival at 7.35 p.m., 50 min. faster from Jersey than last summer, on Mondays, Tuesdays, Wednesdays, and Fridays. The same will apply on Thursdays up to August 10, from which date there will be separate boats from Jersey and Guernsey at the same times, Jersey passengers reaching Waterloo 31 min. earlier, at 7.4 p.m. On Friday and Saturday nights from mid-July there will be a night service from Jersey at 8.15 p.m. and Guernsey at 10.30 p.m., with a Waterloo arrival just after 9.30 a.m.; and on Saturdays from June 17 to September 9 an additional day boat will be provided from Jersey only at 10 a.m., bringing passengers into Waterloo by 8.13 p.m. As usual, sailing tickets will be required for certain sailings during the high season.

It should be added that the final sailing from Southampton Docks to the Channel Islands is to be on Saturday night, May 13. From then until the introduction of the summer service there will be a daily departure from Waterloo at 8.10 a.m., with an arrival in Guernsey at 4.30 p.m., and Jersey at 6.45 p.m., and on Friday and Saturday nights from May 19-20 there will be a night boat also, with connecting train from Waterloo at 9.15 p.m., giving arrivals in Guernsey and Jersey at 6.0 and 8.15 a.m. respectively. There will be corresponding return services.

On the Bournemouth line the 8.20 a.m. 2-hr. express from Waterloo is being brought into line with the other even-interval departures on this route by leaving the terminus at 8.30 a.m., and reaching Bournemouth Central at 10.30 a.m., and Bournemouth West at 10.42 a.m. This alteration is to operate from May 1. The train concerned has recently added a through portion for Weymouth, which with the later London departure will arrive in Weymouth at 11.35 a.m. From the same date the present 8.30 a.m. Down, to which formerly the Weymouth portion was attached (and did not reach Weymouth until 12.21 p.m.) is to start 5 min. later, omit its Micheldever call, and maintain its present times from Winchester onwards. As is usual during the summer season, there will be two additional Bournemouth 2-hr. trains, at 2.30 p.m. Down and 7.40 p.m. Up from Bournemouth Central (7.28 p.m. from West).

A minor alteration to the up "Atlantic Coast Express" will give the Southern Region its second mile-a-minute run for, as in the Down direction, it will cover the 83.7 miles from Salisbury to Waterloo in 83 min., arriving at 3.38 p.m. From March 6, an additional steamer has been running from Portsmouth Harbour to Ryde Pier on Mondays, Tuesdays, Wednesdays, and Fridays (there is already an 11.40 p.m. steamer on Thursdays) in connection with the 8.50 p.m. from Waterloo, and this will continue during the summer.

Malayan Railways

STRINGENT economy and a realistic policy of seeking traffic and quoting competitive rates resulted in the Malayan Railway Administration suffering a deficit in 1959 of only $163,900 instead of an expected $6·7 m. This is explained by Mr. E. T. Williams, Chairman & General Manager, in his annual report, which is a model of its kind—well illustrated, with multi-colour charts and illustrations. Mr. Williams describes 1959 as a year of uncertainty after the trade depression of the previous year, but points out that trade improved in the second half-year.

The pattern of the timetable remained unchanged, but a new timetable for the main line was introduced between Kuala Lumpur and Singapore to take advantage of the improvement in the emergency. A total of 86 per cent of all goods traffic was carried at special rates, earning 73 per cent of goods revenue.

In spite of a decrease in the number of second-class passengers, the total number of fare-paying passengers increased by 2·45 per cent, and passenger revenue by 0·17 per cent. Revenue from goods traffic improved 6·99 per cent and tonnage carried by 22·66 per cent, the disparity being explained by a greater increase in iron-ore traffic during a period when the output of tin was severely restricted. There was no significant change in the goods tariff book during the year, but, as in 1958, the intense competition from road and sea caused the practical level of rates charged to fall considerably owing to the introduction of special rates to prevent traffic being diverted to competitive forms of transport.

The Railway Administration's holdings in the Cargo Handling Corporation and the Kuala Lumpur-Singapore Express Limited remain unchanged. An interest was also acquired in the Butterworth-Kuala Lumpur Express Bus Company. A loan agreement was completed with the U.S. Development Loan Fund for part of the funds needed to construct three new deep water berths in the North Klang Straits. Tenders were called, and the contract was awarded to Christiani & Neilson of Copenhagen, in conjunction with Gammon (Malaya).

Malayanisation has continued steadily, and at the end of 1959 there were only 28 expatriate officers remaining in service compared with 35 a year earlier and 102 in 1949. A further 12 were expected to leave the service during 1960.

On the operating side there was a sharp drop in engine failures from 210 in 1958 to 135 in 1959, the average engine mileage per failure rising to 33,378 against 26,416.

The last of the 26 diesel-electric locomotives went into service in January, 1959. Nearly 40 per cent of the total monthly mileage was being done by these engines, providing substantial saving both in fuel and maintenance expenditure.

The principal results for the years 1958 and 1959 were:—

	Rail Services	Collection & delivery	Ferry Services	Rentable property	Minor ports	Total
1959	$	$	$	$	$	$
Operating revenue	56,722,458	878,213	512,773	1,776,993	43,547	59,933,984
Working expenses						
Operating expenditure ...	47,987,289	942,897	557,790	1,342,064	41,202	50,871,442
Special expenditure:—						
Completed works ...	128,576	—	—	23,683	—	152,259
Uncompleted works and services ...	82,343	—	—	14,837	—	97,180
Provision of renewals ...	7,510,794	—	58,444	3,473	—	7,572,711
Total ...	55,709,002	942,897	616,234	1,384,057	41,402	58,693,592
Balance carried forward to net revenue (cr.) ...	1,013,456	—	—	392,936	2,145	1,240,392
account (dr.)	—	64,684	103,461	—	—	—
Operating ratio (per cent) ...	98·2	107·4	120·2	77·9	95·1	97·9
1958						
Operating revenue ...	54,661,132	703,006	451,060	1,763,893	38,750	56,617,841
Working expenses	58,893,573	708,113	703,002	1,430,761	57,053	61,792,502
Balance carried forward to net revenue (cr.) account (dr.)	— 4,232,441	— 5,107	— 251,942	333,132 —	— 18,303	— 4,174,661
Operating ratio (per cent) ...	107·7	100·7	155·9	81·1	147·2	107·2

British Transport Commission traffic receipts

THE British Transport Commission's traffic receipts for the four weeks ended March 26 show that steady progress is being maintained on the passenger side compared with the same period last year. Passenger receipts were up by 9·7 per cent on British Railways and Merchandise & Livestock and Passenger Parcels showed small but encouraging increases. Minerals and Coal & Coke revenue continued to decline compared with last year's figure but revenue from mineral traffic was slightly up on the previous four weeks of this year. It is

separate (the latter carrying the Gotthard line trains), are to be rearranged to facilitate the movement of trains. The Muttenz extension will handle international freight traffic. Another track rearrangement under consideration is at Emmenbrücke, just north of Lucerne, where the Gotthard line is joined by the lines from Basle and Berne, resulting in very dense passenger train movement between Emmenbrücke and the terminal station at Lucerne.

The reconstruction of Göschenen Station, at the north portal of the Gotthard tunnel, is practically complete. An island platform has been built, with subway access, and the freight yard has been considerably enlarged. Because of limited space in the narrow valley, a second tunnel has been bored parallel to the existing tunnel for about ½ mile. This will house the shunting necks at the south end of the station. One of the lines has been prolonged to join the southbound main line in the tunnel.

Congestion through the tunnel is due in part to the great increase in the number of motorcars now carried between Göschenen and Airolo, for the handling of which special facilities have been established at both stations. About 25 trains are advertised daily in each direction for motorcar transport, and at times like Easter, when the Gotthard Pass is still closed by snow, this number may be considerably increased.

Before the line was built from Lucerne to Immensee, the original Gotthard line ran from Rotkreuz, on the Lucerne-Zurich line, to Immensee. This still forms part of a direct route from Basle to Arth-Goldau, via the east curve at Olten, Aarau, Lenzburg, and Wohlen to Immensee, which is used by all the heavy freight traffic, and also by the important night "Italia Express" and "Riviera Express" sleeping car services, which have no publicly-advertised stop between Basle and Bellinzona. Hitherto, this line has been single-track between Wohlen and Immensee, but doubling between Rotkreuz and Immensee is nearly complete, and will be followed by doubling from Wohlen to Rotkreuz. Automatic signalling also is to be installed between Immensee and Arth-Goldau.

A further contribution to increasing line capacity is the locomotive-building programme described in our February 10 issue. The new 5,600 h.p. Bo-Bo locomotives are to take over passenger services, releasing more of the 6,000 h.p. Ae 6/6 Type Co-Co locomotives for freight service; the existing 50 of this class are to be supplemented by a further 24, which will be completed by 1964. These locomotives are designed to maintain a speed of 75 km.p.h. (46 m.p.h.) up the continuous gradients of 1-in-38½/40 to the Gotthard tunnel, and the intention is to use the Ae 6/6 Type in pairs of 1,200 h.p., with multiple-unit control, which will thus make possible the working of 1,200-ton freight trains, so greatly easing the line occupation problem.

Management development

MANAGEMENT becomes more complex daily and the urgency and seriousness of the need for management equipped to contend successfully with the many problems of industrial economy can scarcely be challenged. To assist in meeting this need Mr. George N. Daffern has written a book,* which is of particular interest in that it owes its origin to a resolution passed by the Railway Progress Institute in New York in 1956. The author is well qualified to deal with his subject for, in addition to his specialised knowledge of it, he has a background of railway experience.

The world is a rapidly-changing place, and change always presents challenge. To meet this challenge industrial leaders will need all their intelligence, ingenuity, imagination, and, Mr. Daffern suggested, perhaps most important of all, concern for human welfare. Attention to the last-mentioned aspect, as indeed with all other items of management, must be reflected in the welfare of the organisation.

Among the factors which are listed as being requisites of better management is performance appraisal; more than half of the book is devoted to the evolution of a performance appraisal procedure, the facets of purpose, method, results, and management inventory all being considered in their many aspects.

Purpose devolves from the fact that management development on railways has perforce to be realistic. There is little or no cash in the till to follow fashion or indulge in fads or fancies. Management development has to be essentially a matter of finding out what is the total leadership job needed to ensure survival and what improvements are necessary to get that job done properly. This definition pertinently sums up the problems facing Dr. Beeching from June 1. Top management rightly expects much of its supervisors and they, in turn, expect even more from top management. While some of these expectations might be regarded as so obvious that they do not warrant attention it is extraordinary that they are still neglected. We have in mind the subject of communications: clear, concise and unobstructed lines of communication, up, down, and across, are by no means universal either in railways or other industrial organisations.

Appraisal procedure has not always proved as beneficial as hoped for, and the basic purpose – to improve performance – has not been accomplished sufficiently. Basic reasons for comparatively poor results of performance appraisal procedure, when applied to a railway, resulted from misapplication. Examples of the mistakes made were: the neglect of performance for psychology, basing the procedure on the misconception that the average manager is able to appraise his subordinate's performance accurately, without that subordinate's assistance, and focusing on an individual's weaknesses rather than on his strengths. It would appear that when initiating a performance appraisal procedure the first thing to appraise is the procedure. In this connection Mr. Daffern's book gives much valuable guidance.

The results of performance appraisal, as applied to the operating and traffic departments of a railway are illuminating. Many of the points listed are those which would automatically be dealt with by any enlightened management, with or without the benefits conferred by performance appraisal as it is now understood. We may digress here to reflect that appraisement has been taken in their stride by many competent managers without the application of a label. This is not to say that they cannot profit from studying this book, which drives home fundamentals apt to be overlooked in some quarters. As an example there is a reminder that a job has only one reason for existence, and that is that it is indispensable to the customer.

Top management is only too well aware of the increasing magnitude of its difficulties and while the answers to many, or even most, of its complex problems are not to be found within the covers of a book, that under review is a valuable contribution to the thinking of corporate executives on a problem of common concern.

Southern Region summer services

IN the summer timetable of the Southern Region, which will come into operation on June 13, the most important changes are those relating to the Channel Islands steamers. As compared with last summer, there will be no sailings from or to Southampton, but the entire service will be concentrated on Weymouth. The boat train for the day service will leave Waterloo at 8.10 a.m., Sundays included (5 min. earlier on Saturdays), reaching Weymouth Quay at 11.40 a.m.; the steamer will sail at 12.30 p.m., and reach Guernsey at 4.30 p.m. and Jersey at 6.45 p.m., 1 hr. earlier than in 1960. From June 16-17 to September 8-9 inclusive there will be a night service on Fridays and Saturdays at 9.15 p.m. from Waterloo, reaching Weymouth Quay at 12.52 a.m.; with a steamer departure at 1.30 a.m., Guernsey will be reached at 6 a.m.

* "*Management Development in a Changing World*," by George N. Daffern, Simmons-Boardman Publishing Corporation, New York. $4.00

and Jersey at 8.15 a.m., also 1 hr. earlier than by last summer's service via Southampton. On Fridays and Saturdays from June 30-July 1 to August 25-26, there will be a relief night boat to Jersey only, with a connecting train from Waterloo at 7.45 p.m., and a Jersey arrival at 6 a.m.

In the reverse direction, the day departure will be from Jersey at 9 a.m., and Guernsey at 11.15 a.m., with a Waterloo arrival at 7.35 p.m., 50 min. faster from Jersey than last summer, on Mondays, Tuesdays, Wednesdays, and Fridays. The same will apply on Thursdays up to August 10, from which date there will be separate boats from Jersey and Guernsey at the same times, Jersey passengers reaching Waterloo 31 min. earlier, at 7.4 p.m. On Friday and Saturday nights from mid-July there will be a night service from Jersey at 8.15 p.m. and Guernsey at 10.30 p.m., with a Waterloo arrival just after 9.30 a.m.; and on Saturdays from June 17 to September 9 an additional day boat will be provided from Jersey only at 10 a.m., bringing passengers into Waterloo by 8.13 p.m. As usual, sailing tickets will be required for certain sailings during the high season.

It should be added that the final sailing from Southampton Docks to the Channel Islands is to be on Saturday night, May 13. From then until the introduction of the summer service there will be a daily departure from Waterloo at 8.10 a.m., with an arrival in Guernsey at 4.30 p.m., and Jersey at 6.45 p.m., and on Friday and Saturday nights from May 19-20 there will be a night boat also, with connecting train from Waterloo at 9.15 p.m., giving arrivals in Guernsey and Jersey at 6.0 and 8.15 a.m. respectively. There will be corresponding return services.

On the Bournemouth line the 8.20 a.m. 2-hr. express from Waterloo is being brought into line with the other even-interval departures on this route by leaving the terminus at 8.30 a.m., and reaching Bournemouth Central at 10.30 a.m., and Bournemouth West at 10.42 a.m. This alteration is to operate from May 1. The train concerned has recently added a through portion for Weymouth, which with the later London departure will arrive in Weymouth at 11.35 a.m. From the same date the present 8.30 a.m. Down, to which formerly the Weymouth portion was attached (and did not reach Weymouth until 12.21 p.m.) is to start 5 min. later, omit its Micheldever call, and maintain its present times from Winchester onwards. As is usual during the summer season, there will be two additional Bournemouth 2-hr. trains, at 2.30 p.m. Down and 7.40 p.m. Up from Bournemouth Central (7.28 p.m. from West).

A minor alteration to the up "Atlantic Coast Express" will give the Southern Region its second mile-a-minute run for, as in the Down direction, it will cover the 83.7 miles from Salisbury to Waterloo in 83 min., arriving at 3.38 p.m. From March 6, an additional steamer has been running from Portsmouth Harbour to Ryde Pier on Mondays, Tuesdays, Wednesdays, and Fridays (there is already an 11.40 p.m. steamer on Thursdays) in connection with the 8.50 p.m. from Waterloo, and this will continue during the summer.

Malayan Railways

STRINGENT economy and a realistic policy of seeking traffic and quoting competitive rates resulted in the Malayan Railway Administration suffering a deficit in 1959 of only $163,900 instead of an expected $6·7 m. This is explained by Mr. E. T. Williams, Chairman & General Manager, in his annual report, which is a model of its kind—well illustrated, with multi-colour charts and illustrations. Mr. Williams describes 1959 as a year of uncertainty after the trade depression of the previous year, but points out that trade improved in the second half-year.

The pattern of the timetable remained unchanged, but a new timetable for the main line was introduced between Kuala Lumpur and Singapore to take advantage of the improvement in the emergency. A total of 86 per cent of all goods traffic was carried at special rates, earning 73 per cent of goods revenue.

In spite of a decrease in the number of second-class passengers, the total number of fare-paying passengers increased by 2·45 per cent, and passenger revenue by 0·17 per cent. Revenue from goods traffic improved 6·99 per cent and tonnage carried by 22·66 per cent, the disparity being explained by a greater increase in iron-ore traffic during a period when the output of tin was severely restricted. There was no significant change in the goods tariff book during the year, but, as in 1958, the intense competition from road and sea caused the practical level of rates charged to fall considerably owing to the introduction of special rates to prevent traffic being diverted to competitive forms of transport.

The Railway Administration's holdings in the Cargo Handling Corporation and the Kuala Lumpur-Singapore Express Limited remain unchanged. An interest was also acquired in the Butterworth-Kuala Lumpur Express Bus Company. A loan agreement was completed with the U.S. Development Loan Fund for part of the funds needed to construct three new deep water berths in the North Klang Straits. Tenders were called, and the contract was awarded to Christiani & Neilson of Copenhagen, in conjunction with Gammon (Malaya).

Malayanisation has continued steadily, and at the end of 1959 there were only 28 expatriate officers remaining in service compared with 35 a year earlier and 102 in 1949. A further 12 were expected to leave the service during 1960.

On the operating side there was a sharp drop in engine failures from 210 in 1958 to 135 in 1959, the average engine mileage per failure rising to 33,378 against 26,416.

The last of the 26 diesel-electric locomotives went into service in January, 1959. Nearly 40 per cent of the total monthly mileage was being done by these engines, providing substantial saving both in fuel and maintenance expenditure.

The principal results for the years 1958 and 1959 were:—

	Rail Services	Collection & delivery	Ferry Services	Rentable property	Minor ports	Total
1959	$	$	$	$	$	$
Operating revenue	56,722,458	878,213	512,773	1,776,993	43,547	59,933,984
Working expenses						
Operating expenditure ...	47,987,289	942,897	557,790	1,342,064	41,202	50,871,442
Special expenditure:—						
Completed works ...	128,576	—	—	23,683	—	152,259
Uncompleted works and services ...	82,343	—	—	14,837	—	97,180
Provision of renewals ...	7,510,794	—	58,444	3,473	—	7,572,711
Total ...	55,709,002	942,897	616,234	1,384,057	41,402	58,693,592
Balance carried forward to net revenue (cr.) account (dr.)	1,013,456 —	— 64,684	— 103,461	392,936 —	2,145 —	1,240,392 —
Operating ratio (per cent) ...	98·2	107·4	120·2	77·9	95·1	97·9
1958						
Operating revenue ...	54,661,132	703,006	451,060	1,763,893	38,750	56,617,841
Working expenses	58,893,573	708,113	703,002	1,430,761	57,053	61,792,502
Balance carried forward to net revenue (cr.) account (dr.)	— 4,232,441	— 5,107	— 251,942	333,132 —	— 18,303	— 4,174,661
Operating ratio (per cent) ...	107·7	100·7	155·9	81·1	147·2	107·2

British Transport Commission traffic receipts

THE British Transport Commission's traffic receipts for the four weeks ended March 26 show that steady progress is being maintained on the passenger side compared with the same period last year. Passenger receipts were up by 9·7 per cent on British Railways and Merchandise & Livestock and Passenger Parcels showed small but encouraging increases. Minerals and Coal & Coke revenue continued to decline compared with last year's figure but revenue from mineral traffic was slightly up on the previous four weeks of this year. It is

	Four weeks to		Incr. or decr.	Aggregate for eight weeks to		Incr. or decr.
	Mar. 26, 1961	Mar. 27, 1960		Mar. 26, 1961	Mar. 27, 1960	
	1961 £000	1960 £000	£000	1961 £000	1960 £000	£000
Passengers—						
British Railways	10,436	9,505	+ 931	29,584	27,330	+ 2,254
London Transport—						
Road passenger services	4,590	4,251	+ 339	13,175	12,644	+ 531
Railways	2,203	1,986	+ 217	6,499	5,878	+ 621
Provincial & Scottish buses	4,481	4,184	+ 297	13,077	12,322	+ 755
Ships	249	219	+ 30	736	656	+ 80
Total passengers	21,959	20,145	+1,814	63,071	58,830	+ 4,241
Freight, Parcels & Mails—						
British Railways—						
*Merchandise & livestock	8,328	8,065	+ 263	24,241	23,769	+ 472
*Minerals	3,794	3,942	− 148	11,341	11,693	− 352
*Coal & Coke	8,667	9,020	− 353	27,304	28,427	− 1,123
*Parcels, etc., by coaching train	4,333	4,303	+ 30	12,390	12,372	+ 18
*Total freight British Railways	25,122	25,330	− 208	75,276	76,261	− 985
†Others	4,996	4,617	+ 379	14,327	12,907	+ 1,420
Total freight, parcels & mails	30,118	29,947	+ 171	89,603	89,168	+ 435
Total	52,077	50,092	+1,985	152,674	147,998	+ 4,676

*Includes receipts from collection and delivery, etc.
†Receipts from railway movements wholly within dock areas, included in previous periods under "Freight, Parcels and Mails," are now classified as miscellaneous.

because of decline in these traffics that British Railways' total freight position is down by 0·8 per cent on the four-weekly comparison and by 1 per cent on aggregate. It may be that one result of the National Coal Board's recently-announced scheme to sell coal on a "hire-purchase" system will encourage the sale of coal in such quantities so as to divert it back to rail.

PERCENTAGE VARIATIONS 1961 COMPARED WITH 1960

	Four weeks to March 26, 1961	12 weeks to March 26, 1961
British Railways:		
Passengers	+ 9·7	+ 8·2
Parcels	+ 0·6	+ 0·1
Merchandisea & livestock	+ 3·2	+ 1·9
Minerals	− 3·7	− 3·0
Coal & Coke	− 3·9	− 3·9
Total	+ 2·0	+ 1·2
Ships (passengers)	+13·6	+12·1
British Road Services, Inland Waterways & Ships (cargo)	+ 8·2	+11·0
Road Passenger Transport, Provincial & Scottish	+ 7·0	+ 6·1
London Transport—		
Railways	+10·9	+10·5
Road services	+ 7·9	+ 4·2
Total	+ 8·9	+ 6·2
Aggregate	+ 3·9	+ 3·1

LETTERS TO THE EDITOR

THE EDITOR IS NOT RESPONSIBLE FOR THE OPINIONS OF CORRESPONDENTS

EARLY TIMETABLES

March 24

SIR, If the condensed all-region main-line British timetable envisaged by Mr. J. N. Faulkner is started, is it too much to hope that there might also be an advance summer-service edition published in February or March? Most Continental railways do this, as do the coach and air companies; anyone in the travel trade will confirm how useful it would be.

Yours faithfully,

J. H. PRICE

15, Kingslyn Crescent,
Upper Norwood, S.E.19

THE AMERICAN RAILWAY POSITION

April 8

SIR, In your April 7 issue, an article on the American situation closed with a reference to the preliminary report of a study group set up by the Senate to review transport policies. The report deserves more notice because the group examined recent transport trends and estimated their effect if they continued until 1975. It concluded that technical development, public subsidies, traders' desire for competing types of transport and the policies of regulating bodies are combining to bring about too many carriers and excessive transport facilities. If in consequence the railways cannot adjust expenses to declining volume of business, they may have to be taken over by the Government.

The position of common carriers in road and water transport is also weakening, with the result, in the group's opinion, that social investment per ton-mile and passenger-mile in transport service will rise. Yet the study group doubts whether private and contract carriers can deal with the growing needs for transport. The position of the railways, as the largest common carrier industry, is thought to be precarious, because they must supply their own capital requirements for way and structures as well as equipment, while being subject to intense competition. The railways serve every part of the States and so their future, the group feel, is of national public interest and should be safeguarded.

The draft report has to run the gauntlet of an advisory council and other interested parties before the Senate Interstate & Foreign Commerce Committee adjudicates its recommendations. While that procedure drags its slow length along, a critical stage may arise when the President may find that the time for meditation is over and action becomes obligatory.

Yours faithfully,

R. BELL

Clacton-on-Sea

RIDING QUALITIES OF PASSENGER VEHICLES

April 4

SIR, I have read your valuable journal for many years and of late I have been somewhat impressed by various highly academic articles on bogie design. I cannot reconcile these contributions with the fact that the riding qualities of the newest passenger stock on British Railways are so deplorable. In fact, we seem to have entered an era of extreme discomfort in rail travel.

There is, for instance, the much-publicised shortcomings of the North Kent expresses, and for a really uncomfortable ride there are few services which can equal the green diesel units of the Western Region, especially on that section of the track between Didcot and Oxford.

Or to take another example. A friend of mine recently travelled by first-class Pullman on the 4.55 p.m. Paddington to Bath. Five cups of tea were poured out, all of which were lost on the tablecloth. The crowning indignity came when he was removing some jam from the pot. A terrific jolt precipitated a blob of jam onto his cheek. This is a business man who is reluctantly turning from road to rail travel because of traffic congestion on the roads, but he is now having second thoughts about it.

My first experience of long-distance rail travel was on the old West Coast Joint Stock expresses (about 1915, I think), and my father drew my attention to the absolutely smooth running of ordinary coaches and dining car so much so that scarcely any water would spill out of a full glass. Can you, Sir, or any of your technical experts tell us why these results could have been achieved then and right through the '20s and '30s by engineers who had very little knowledge of the theories enunciated in recent articles?

The logic of the matter would appear to be that the old-

rolling-stock designers knew a great deal more about the business than the academicians of the present day. Or is it that the track is partly responsible for the appalling riding qualities of the modern coaches? When I scan certain sections on the Western Region and compare them with what I remember of the old L.N.W. who advertised "the finest permanent way in the world," then I am somewhat amazed that what was done then cannot be done now.

I am a great supporter of railway travel and can only feel sorry that the present generation may grow up not knowing what fine standards of comfort there could be by train.

Yours faithfully,

"CONSULTING ENGINEER"

London, S.W.1

WINNING BACK RAILWAY PASSENGERS

March 26

SIR, With the appointment of a new Chairman to the British Transport Commission, it is obvious that the "winds of change" will soon be blowing through the corridors of headquarters at Marylebone. Now, therefore, would seem to be an apt moment for a reappraisal of the whole basis of our railway services. The carriage of goods and passengers are really two distinct problems, although probably the railwayman would be less likely to see it so than the outsider. Both problems are fraught with difficulties but it is the passenger services to which I would like to give some thought at this moment.

Men have always travelled, but never more so than in this age when many people own private means of transport which get them from place to place more quickly and over much vaster distances than was possible only 50 years ago. Door-to-door personal transport may be very convenient provided everybody else is not undertaking it on an ever-increasing scale. Many of our roads are congested and dangerous, parking is an increasing problem, and everything points to the coming of a situation when the advantages of personal transport will be outweighed by the disadvantages. This, briefly, is the situation which the railways are up against. Can they prevent a further loss of traffic to the roads and can they win back some of that traffic they have already lost?

Where fast, clean, and comfortable trains link the Capital with provincial and other sizeable towns, the railways appear to be holding their own. Arrangements for self-drive car-hire at the destination will further assist them to do so. In addition, they might consider it worth while to grant free parking space for the cars of those passengers booking return tickets over a distance of 25 miles or more, thus adding to the convenience of passengers. Suburban traffic has its own peculiar problems on which I do not intend to enlarge. So long as people insist on working in cities while living on the outskirts there will be a demand for heavy-density rail services. The problems are more of operation than of looking for traffic.

The real problem for the railways lies in that vast area lying between and on the fringe of the great industrial conurbations. These areas include a number of medium-size towns, while on the coast are resorts which attract heavy holiday traffic from the inner industrial groups. The background to this forms an agricultural area scattered by small market-towns separated from each other by anything from five to 20 miles. Larger centres usually lie between 40 and 50 miles apart. Nobody with his own form of transport would dream of walking half a mile to his village station to proceed by train some five miles to the nearest market-town, especially if a further walk was entailed the other end. Again, if from the market-town there are only infrequent, slow, and many-stopping trains to the nearest city, it is most unlikely that he will leave his car behind and use the railway. In this connection, it must be noted that the rural bus is no longer the keen competitor that it was in the '20s and early '30s, itself feeling the competition from the motor car. The situation is unlikely to improve, for with the increasing mechanisation of farming and consequent reduction in rural working population, those remaining are increasingly coming on a financial par with their town industrial cousins. Socially, too, the modern farm worker is a different species.

What then is the answer? How can the railways so attract these people to use their services? The answer is definitely not to go on closing down branch lines except where they happen to be *cul-de-sac* branches leading from one small place to one of even less importance. Where a branch forms a link in a throughout which could be used by fast-moving diesel multiple trains connecting smaller cities and market towns with large industrial conurbations, every effort should be made to provide such services. I see no reason why, provided that conditions of travel are made attractive (and in this connection the service should be on a regular interval basis, even if only every two hours), much lost traffic could not be won back to the railways. If wholesale closure takes place, whole areas will be without rail communication and the country will suffer a severe social loss.

Is there any justification for the belief that semi-fast expresses over considerable distances and at regular intervals would bring back lost traffic? The introduction of the "Trans-Pennine" diesel trains gives the answer. It is reported that in the first week of operation there was an increase of passengers of 30 per cent from Hull and Huddersfield and 45 per cent from Leeds. The Southern Region has had similar experiences in the south-east where most of its express trains are in reality semi-fast trains. Admittedly, the Southern still continues with stopping trains, but then the three south-eastern counties are very largely suburbanised.

With the changes that are bound to come under the new management, I hope that in the interests of the railwaymen, the transport user and the country as a whole you will give serious thought to supporting a solution somewhat on the lines that I have laid down.

Yours faithfully,

D. W. MOUNTAIN

34, Harbury Road,
Carshalton, Surrey

TRANSPORT USERS' CONSULTATIVE COMMITTEES

March 27

SIR, It seems fairly certain that Dr. Beeching and his Railway Board will need to take immediate and drastic action to reduce the deficit which is now put at over £300,000 a day.

This is surely the time to pass enabling legislation abolishing altogether those functions of the consultative committees which cover the proposed withdrawal of train services and the closure of lines and stations. The railways are required to operate as a commercial undertaking and they should have absolute freedom to decide what facilities must be withdrawn subject, say, to giving three months' notice of their decision.

It is still widely believed that railway managements "enjoy" cutting out unremunerative services and closing stations. Worse still, several major proposals have been challenged by parties of amateur busybodies seeking to prove that their own figures of user and costs are correct and that those of the railway are purposely distorted to support a case. Do these people realise that there is a time-lag of anything up to a year, perhaps longer, between initiation of a proposal and its implementation, the losses continuing all this time?

In my view the consultative committees should be retained as a channel for handling complaints or suggestions about the Commission's services, or lack of them. Their use as a means of deciding—for such is virtually, if not legally, the case—whether or not some line or station shall be closed is now totally unrealistic, time-wasting and expensive. To hamstring a commercial undertaking keen to put its house in order seems quite indefensible.

Yours faithfully,

C. R. CLINKER

9, Regent Place,
Rugby, Warwickshire

The Scrap Heap

Interest rewarded

In circular No. 275 of June, 1930, on the Rhodesia Railways, Driver R. Welensky—now Sir Roy, Prime Minister of the Federation of Rhodesia and Nyasaland—was awarded £1 for a suggestion to place a protective tail-light on engines.

No exit

An American found the following notice at North Acton tube station the other day: "Staff sick. Pay the other end." When he got out at Lancaster Gate, he found another notice. It said: "Staff sick. Pay the other end."—*From the "Evening Standard."*

Ladies man train

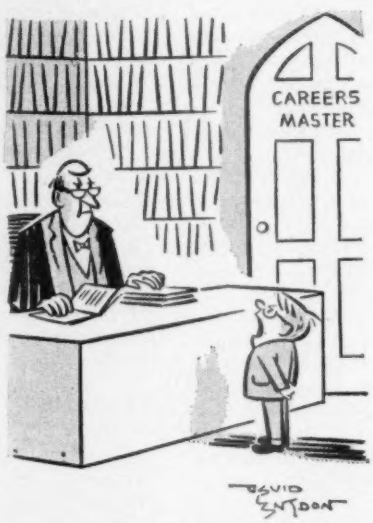
As part of a plan to speed up suburban services, a new diesel multiple-unit train with an all-woman Chinese crew has been put into service in the Peking area. Called "East Wind," the six-car train has four double-deck coaches and two power cars. Each coach seats 198 passengers. The stock was built at Tsingtao workshops.

Near thing

The presence of mind of a Jamaican woman porter on the Bakerloo line of the London Transport Executive saved the life of a blind man at Piccadilly Circus Underground Station recently. The man, who had alighted to change lines, turned the wrong way along the platform and fell on the line. The clatter of his cane against the rails alerted Miss Maria Bascoe, the woman porter, who also heard a train approaching. Shouting: "Keep still, keep still, I will come and help you," she rushed back along the platform, waving her arms to the driver of the train, and shouting "Stop, stop!" The motorman saw her, pulled up, and then helped her get the man back on the platform. Later, Miss Bascoe said she had joined London Transport because she "wanted a job where she could meet people and talk to people."

Recherché

Paris will not seem the same without . . . those weird, fanciful, flamboyant, wrought-iron entrances to the Metro, almost plant-like in their entangled growth, which are to be . . . replaced by more sombre and functional edifices. Built around 1900, they stand today crumbling and corroded. . . . Of the 100-odd remaining, some five or six are to be retained in use and restored. . . . The most notable is the prodigious "Pavilion Dauphine," which stands at the Porte Dauphine Station on the edge of the Bois de Boulogne, and has about it the air of a woodland grotto. The rest are being offered by the Paris transport authorities . . . to anyone interested in preserving them. . . . Inquiries have come from museums in Frankfurt, Munich, Hamburg and Amsterdam; and several museums in France have indicated stations of their choice. The Paris authorities note that no British museum has shown any interest so far.—*From "The Times," March 29.*



[Reproduced by permission of "Punch"]

"Isn't the trouble with industry, sir, that you can go to the very top and then end up saddled with British Railways?"

Functions of an executive

As nearly everyone knows, an executive has practically nothing to do except to decide what is to be done, to tell somebody to do it, to listen to reasons why it should not be done, why it should be done by someone else, or why it should be done in a different way; to follow up to see if the thing has been done, to discover that it has not, to inquire why, to listen to excuses from the person who should have done it; to follow up again to see if the thing has been done only to discover that it has been done incorrectly; to point out how it should have been done, to conclude that as long as it has been done, it may as well be left where it is; to wonder if it is not time to get rid of a person who cannot do a thing right; to reflect that he has probably a wife and large family and that certainly any successor would be just as bad and maybe worse; to consider how much simpler and better the thing would have been done if one had done it oneself in the first place; to reflect sadly that one could have done it right in 20 minutes, and as things turned out one has had to spend two days to find out why it has taken three weeks for somebody else to do it wrong.

Not angels, but Angles

An excursion returning to Llanelly from Porthcawl on Easter Monday night was turned into a "moving den of hooliganism," according to a British Railways spokesman. Nine out of ten carriages, carrying more than 700 young people—mostly teenagers—were extensively damaged. Upholstery was torn and slashed, doors damaged, and 10 window panes broken. During the 22 miles from Porthcawl to Swansea, the communication cord was pulled nine times. A British Railways police officer who had joined the train was powerless. He was swamped by the hooliganism and the rowdyism and he has reported that he has never seen anything so like riot, or even mob riot. While the train was stationary in Port Talbot for extra police to make inquiries, all the youngsters inside were like angels and the blame for the damage and hooliganism could not be attributed to anybody. But once they left the trouble started again.

Voice in the wilderness

The following letter has been received by the Public Relations & Publicity Officer of the London Midland Region of British Railways:

March 27

Dear Sir,

I am writing to congratulate British Railways on the excellence of the special train service laid on for the Grand National at Aintree last Saturday.

My wife and I travelled on the 7.45 second class train from Euston. The standard of meals and service left nothing to be desired and the train was, all things considered, extremely punctual on both the outward and return journeys.

I think that for £4 10s. the trip was remarkably good value, and my only complaint is that the winner of the race could not be forecast as part of the service. Perhaps this could be remedied next year.

Many thanks for a most enjoyable outing.

Yours faithfully,

N. V. CARTER

128, Station Road,
Redhill, Surrey

OVERSEAS RAILWAY AFFAIRS

FROM OUR CORRESPONDENTS

ARGENTINA

Preference for Argentine products

Congress is to discuss a proposal for a law to give absolute preference to Argentine firms in any tenders to be called for the State Railways and other State-owned undertakings.

CANADA

New straddle-carrier

A new straddle-carrier is undergoing tests at Canadian National Railways Bonaventure freight yard in Montreal. Known as the Travelift, it can lift large containers and trailers up to 40 tons, and complete a transfer from road to flat wagons in less than five minutes.

VICTORIA

Melbourne area developments

A Bill has been introduced in the Victorian Parliament allocating £A.11,000,000 from loan funds for expenditure on railway development works, notably the Albury-Melbourne standardisation and associated works. These include a new motive-power depot at Dynon and the reconstruction and remodelling of Spencer Street Station. Also included is the construction of a new flyover at North Melbourne to enable suburban and country passenger-train services to be separated, and another near Melbourne cricket ground. The completion of bridgework at Richmond will also be covered, as will triplication of track between Hawthorn-East and Camberwell.

" Fruit Flier "

Victoria's fruit and vegetable train, the " Fruit Flier," has been restored on Sunday evenings between Mildura and Melbourne. The " Fruit Flier " now runs six days a week, on Sundays through to Fridays. The train leaves Mildura at 5 p.m. to pick up fruit and vegetables at Irymple, Redcliffs, Carwarp, and Hattah for the Ballarat and Melbourne markets.

More " Harris Trains "

Seven more " Harris Trains " for metropolitan services are under construction at the Newport Workshops of Victorian Railways. Carriage doors and other internal fittings are being manufactured and stored so that ample stocks will be available to ensure a smooth flow of carriages. Bogies are being assembled at Bendigo Workshops. Power coaches for the trains are being constructed at Martin & King's works at Clayton, and the first unit under the current 30-train contract should arrive soon at Jolimont Workshops. The first complete seven-car train is expected to enter service about June. With the new coaches, seating capacity has been increased from 465 to 515 on each train.

Level crossings

Flashing lights are to be installed on 11 level crossings and boom barriers constructed on two others on Victorian Railways.

The Travelift, Canadian National Railways' new straddle-carrier

WESTERN AUSTRALIA

Exit steam on the Midland Railway

What was expected to be the last appearance of a steam locomotive in service on the Midland Railway took place recently when the Western Australian Division of the Australian Railway Historical Society had a rail outing to Mooliabeenee. The special train from Midland Junction was hauled by No. 18 4-6-2 locomotive. Built by Kitson & Co. Ltd., of Leeds, England, in 1912, No. 18 was one of a class of 25-30 engines, weighing 77 tons and having a tractive effort of 16,600 lb. The Midland, the largest privately-owned-and-worked railway in Australia, has a route-mileage of 277, and is now entirely diesel-worked. It was built gradually between 1890 and 1894 parallel to but mostly well inland from the west coast of W.A. to terminate at Walkaway near Geraldton; it has no branches.

GERMANY

Wiesbaden-Frankfurt electrification

Travelling times between Wiesbaden and Frankfurt have improved by from eight to 12/15 min. since train services were electrified on January 16.

NETHERLANDS

International goods transport

According to figures released by the Netherlands Central Statistical Bureau on March 1, international goods transport through Rotterdam increased in 1960 by 12,712,000 tons carried in sea-going ships, or 18 per cent more than in the previous year. Goods transport

via inland waters increased by 6,995,000 tons (23 per cent), and by rail or road by 307,000 tons (14½ per cent). The 1960 figures for incoming—outgoing goods transport through Rotterdam were: ocean-going vessels, 83,405,000 tons; inland shipping, 37,871,000 tons; rail, 1,122,000 tons, and road transport, 1,313,000 tons.

ANGOLA

Rail development

The Portuguese Government has approved a general plan for the exploitation, transport, and export of iron and manganese ores in Angola. A contract, guaranteed by the Portuguese Government, has been signed by the Cia. Mineira do Lobito and the Sde. Mineira do Lombigo with Krupp of Essen and Hojaard & Schultz of Copenhagen. The project, which will be executed in three stages, involves the construction of two branch lines to the Benguela and Moamedes railways, and the renewal of existing lines. The Danish company, established in Portugal as the Sde. de Empreitadas e Trabalhos Hidraulicos, will carry out construction work, while Krupp will supply and install mining and mineral-grading equipment, mineral freight wagons and locomotives, and port-loading facilities.

SOUTH AFRICA

First South African-built electric train

The first electric train ever to be produced in South Africa, and consisting of an electric unit and six all-steel coaches, was recently completed six weeks ahead of schedule by Union Carriage & Wagon Co. Ltd., at Nigel (40 miles south-east of Johannesburg). It is the first of 56 ordered by South African Railways on a R19-million (£9½-million) contract, and has been built almost entirely out of South African materials. The train was officially handed over to Mr. D. H. C. du Plessis, then General Manager of South African Railways & Harbours, on February 25. It will be used on the Peninsula suburban service in Cape Town.

New locomotives

During October to December, 1960, South African Railways placed 19 Class 5E1 electric locomotives and 13 Class 32 diesel-electric locomotives in service. The former were manufactured by Associated Electrical Industries Limited, United Kingdom, and the latter by the International General Electric Company of the United States. Other new rolling stock added to the establishment included 61 coaches built by the Union Carriage & Wagon Co. Ltd., Nigel, and 1,505 goods wagons of various descriptions. The goods stock included 47 tank-wagons, and 35 short fruit wagons. Two locomotives, 15 coaches and 822 goods wagons were withdrawn from service and scrapped during the period under review.

U.S.A.

Cut in freight rates

Three Western U.S. railways are to reduce freight rates on wheat shipments moving from the Great Plains states to Gulf ports. The Atchison, Topeka & Santa Fe Railway, the Chicago, Rock Island & Pacific Railroad, and the Union Pacific Railroad have stated that the cuts, effective from May 10, will be on a graduated scale depending on distance from the Gulf ports. The cuts will range from ½ cent to 19 cents.

PUBLICATIONS RECEIVED

Turner Glass-Fibre Woven Tapes. The range of Duraglas glass-fibre woven tapes for electrical insulation is described in an illustrated booklet, D4, issued by Turner Brothers Asbestos Co. Ltd. Details are given of tape construction, tensile strength, conductivity, and aqueous extract, also general information on use. An illustration shows Duraglass tape being wound on a transformer coil at the works of the Westinghouse Brake & Signal Co. Ltd. The booklet is obtainable from Turner Brothers Asbestos Co. Ltd., Rochdale, or from any branch office.

Duraglas glass fibre. To illustrate the applications of Duraglas glass fibre, the manufacturers, Turner Brothers Asbestos Co. Ltd., P.O. Box 40, Rochdale, have issued a booklet, Reference D5, "Duraglas for Boatbuilding and Marine Equipment." General information is included on the properties of glass fibre and on methods of fabrication.

Rapier Water Pumps. Particulars of two ranges of water pumps are given in illustrated leaflets issued by Ransomes & Rapier Limited, Waterside Works, Ipswich. Leaflet No. 1/529 describes the Rapier self-priming pumps which are designed for drainage and supply work for contractors' and industrial plants. These pumps range in size from 4,000 to 80,000 gal. per hr., and can pump water containing up to 25 per cent solid matter in suspension. Leaflet No. 1/530 is concerned with the type 2PH self-priming pump, which is primarily designed for marine emergency fire-pump installations, but is also suitable for contractors' work where high heads are required. Both leaflets give technical details and output curves.

Mills Switch Heater. This leaflet describes the Arma infra-red switch heater, produced by Exors. of James Mills Limited, Bredbury Steel Works, Woodley, and described in our issue of February 17 last.

Pacific Steam: The British Pacific Locomotive. By Martin Evans. London: Percival Marshall & Co. Ltd., 19-20, Noel Street, W.1. 8¾ in. × 5¾ in. 80 pp. Illustrated. Price 12s. 6d. For many years Great Western Railway No. 111, *The Great Bear*, was the only 4-6-2 tender engine in Britain. Designed by G. J. Churchward, it entered service in 1908, 22 years after the world's first Pacific, No. 444, *Duplex*, of the Lehigh Valley Railroad. Unlike other Churchward designs, *The Great Bear* was not particularly successful, and in 1924, it was rebuilt as a "Castle" class 4-6-0. Reasons for this are suggested by Mr. Evans in his concise book. The real beginning of the Pacific in this country was in 1922, on the G.N.R., when Sir Nigel Gresley's No. 1470, *Great Northern*, appeared from Doncaster. This was the first of many Pacifics of the G.N.R., L.N.E.R., and successor Regions of British Railways. Their development, and the introduction and development of 4-6-2 engines by Sir William Stanier on the L.M.S.R. and by O. V. Bulleid on the Southern, and subsequent modifications by other engineers, are well described. The last chapter is devoted to post-nationalisation designs, the Class "7" and Class "8"—among the last, and in the view of some people, belated, developments in steam haulage in Britain. Not everybody will agree with Mr. Evans' well-expressed opinions. Tables giving dates of building and re-building would have been helpful.

Beclawat News. The activities of Beckett, Laycock & Watkinson Limited, Acton Lane, London, N.W.10, in the manufacture of windows and other equipment for railways are well shown in the first issue of the house journal, *Beclawat News*. The report by Mr. J. R. Grimsdell on the Railway Division mentions the 70,000 Beclawat windows and over 5,000 sets of sliding-door equipment supplied for British Railways electric locomotives and multiple-unit trains. In the exhibitions and trade fairs section Mr. F. E. Ottley refers to applications of Beclawat products at the British Railways Electrification Exhibition at Battersea last October.

AUTOMATIC SIGNALLING for Melbourne-Albury line

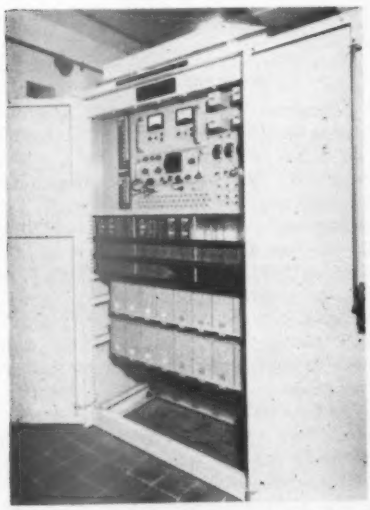
Centralised traffic control from Melbourne, based on A.A.R. standards, will be quick in action and involve the minimum of moving parts

THE new Melbourne-Albury standard-gauge 4-ft 8½-in. track will run for most of its length along the existing 5-ft. 3-in. broad-gauge line. Broad-gauge stations on this railway are manually signalled with track-lock lower-quadrant mechanically operated signals. On double-line sections, train operation between stations is by Winter's block telegraph system and, on single-line, by Webb & Thompson miniature electric train staff.

New signalling throughout

Automatic block signalling will be installed throughout the standard-gauge line. All points and signals will be controlled by a centralised traffic control system with the control point at Melbourne. Colour-light signals of the searchlight type will be used and, where possible, will be located in such a position that drivers can readily identify them and know to which line they apply. Spacing of signals has been arranged for passenger train speeds of 80 m.p.h. and for freight trains at 60 m.p.h.

Distance between warning and stop signals is about two miles. As signals each end of the crossing loop are separated by only a little more than 1,000 yd., it is necessary to make crossings with low-speed signals. Crossings of this type have been satisfactorily constructed on the Melbourne-Geelong line during the past 30 years.



"Westronic" equipment as supplied to British Railways and similar to that described in this article

Where crossing loops are relatively close together—i.e., up to eight miles apart—it is not proposed to provide intermediate automatic signals. Where they are farther apart, the sections are divided to maintain a uniform headway for following aspect, so that warning indications over long distances can be avoided. This is a form of intermediate block signalling on the principle of the automatic intermediate block signalling used on British Railways.

The ten locations at which the tracks of both gauges cross at the same level will be protected by home signals on the standard-gauge line electrically interlocked with points and signals on the broad-gauge track. These home signals form additional intermediate block signals to maintain the uniform headway for following trains.

To prepare the route of the new track, Victorian Railways is carrying out alterations to existing signalling and making those additions which are necessary for the installation of standard-gauge signalling.

Based on best standard

The power-signalling contract was based on the specifications of the Signal Section of the Association of American Railroads. These are most comprehensive and have been the standard adopted by Victorian Railways for power signalling for over 40 years. Contract for the signalling was let to McKenzie & Holland (Aust.) Pty. Ltd. of Newport, Melbourne, Victoria. This company will design and instal the signal apparatus. The Westinghouse Brake & Signal Co. Ltd. of London will supply the latest type of "Westronic" C.T.C. equipment.

Alternative tenders were called for steady-energy and coded-track circuits. Because of the long distances between signals—in many cases, eight miles—coded-track circuits proved economical and will be installed over the greater part of the 197 miles of standard-gauge track.

Main-line points at crossing loops will be operated by dual-control points mechanisms, and manually operated points to "cripple" sidings will be secured by electric switch locks. These "cripple" sidings will accommodate vehicles taken out of traffic because of a "hot box" or some other defect. On the section of line adjacent to the d.c. electrified suburban railway, a.c. apparatus will be used and, on sections beyond,

Diagram of the route controlled by the new signalling

d.c. type. Single-phase 50-cycle power will be distributed at 2,200 V. for operating the 110-V. a.c. apparatus and at 440 V. for charging storage batteries for operation of d.c. apparatus.

To distribute the 440-V. power, a new pole line is being built throughout the major portion of the new railway. It is required for the C.T.C. lines, signal controls, and communications.

Post telephones provide direct communications between trackside locations and train controllers. They can be used for normal operation and emergency working of trains with a pilot staff. This comprises two pilot keys—one at each end of the single-line section. When joined together, they form a staff that supersedes operating by signal indication. The home signals for entering the single-line section are secured at "stop" by removal of the pilot keys.

Long-line communication

To reduce the number of additional pole-line conductors required for communications associated with the new railway, one of the cross-arms has been designed for 12 channel-type transpositions to enable long-line communication equipment to be used. This has also enabled a transistorised electronic C.T.C. system to be used. This is cheaper than a coded system of centralised traffic control.

The contract to erect poles, cross-arms, hardware, and power conductors was let to E. R. Leech & Company of Inverell, New South Wales, and the stringing of the remaining conductors

was entrusted to the Department of the Postmaster-General. This is the most economical arrangement.

"Westronic" system

The "Westronic" multi-station C.T.C. system consists of office equipment, and any number of field stations, each of which controls and indicates as many functions as are required at that particular location. The whole system is linked by a single pair of line wires terminating at the office.

A control table will enable the operator to keep the track layout within his angle of vision and save unnecessary turning of his head. Pushbuttons will be compact and easily accessible. To use a conventional control table would have resulted in many levers being out of reach, because the only control point is in Melbourne and space is available for easy expansion of the system.

When the operator wants to transmit a control, he pushes two buttons to select the field location. A glass indicator above the track line and bearing the location number becomes illuminated, indicating that conditions have been established for the remaining pushbuttons to be effective. The upper row of pushbuttons controls points.

Either the normal or the reverse button is depressed to send a control. This is practically an instantaneous effect, as it is unnecessary to operate a "start" button. The lower row controls signals, left or right signals being cleared by pushing the respective button, or placed to "stop" by pulling it upward.

Auxiliary working

Auxiliary buttons are provided for low-speed signal controls, fitter's call, indicating light dimming, line sectionalising or switching, carrier transfer, acknowledging purposes, and so on. Progress of trains is recorded on automatic train graphs.

Carrier frequency

The control system works at carrier frequency and continually scans the controls and indications. It takes about two seconds to scan the line.

Experience with the time code system showed that operators became impatient when the time between sending the control and receiving the indication was excessive. The electronic system now in use is practically as quick as an ordinary interlocking.

There are practically no moving parts in the control system. Scan-fail alarms are provided, and faults attended to by plugging in printed circuits or relay banks. The actual fault is located on the test bench.

Longest railway lift-span bridge constructed over New York harbour

Over 550 ft. long and providing 135 ft. navigational headway

THE first train has crossed the new bridge across Arthur Kill, a busy arm of New York Harbour. With an overall length of 1,647 ft., it includes the largest lift-span in the world, 558 ft. in length, weighing 2,000 tons and providing a navigational opening over 500 ft. in width and 135 ft. clear height above mean high-water level. When lowered from its normally-raised position to pass a train, the clear headway beneath this span is only 31 ft., so that its range of vertical movement is 104 ft. The new bridge replaces one built in 1888 with a swing-span 496 ft. in length and providing two navigation openings of only 207 ft. The railway crossing this bridge is the Staten Island Rapid Transit subsidiary of the Baltimore & Ohio Railroad.

Greatly increased shipping traffic

So greatly has navigation along Arthur Kill increased in recent years that the average number of vessels now using the channel is some 2,400 a month, including tankers of 100,000 tons moving up to refineries on the New Jersey shore. The old swing bridge had become inadequate to pass such traffic and the Federal Government, acting through the Army Corps of Engineers, ordered its replacement by the new bridge which was estimated to cost about £4,000,000 in all. Opportunity was taken to provide a new structure up to Cooper's E.50 standard, thus enabling B. & O.RR. 70-ton coal wagons to use it instead of 50-ton formerly. The railway's share of the cost was about £687,000.

Constructed 60 ft. distant from the old bridge and parallel to it, the new structure consists of one through-type 163-ft. plate-girder span — the longest of this type on the B. & O. system — 12 deck plate-girders spans of from 50 ft. to 102 ft. in length, and two 32-ft. tower-spans between columns as well as the 558-ft. lift-span.

The latter is slung between two towers 215 ft. high, its 2,000-ton weight being supported by 80 2¼-in. wire ropes, 40 passing over four 15-ft. dia. cast-steel sheaves at the top of each tower. Each sheave weighs 23 tons and carries 10 ropes; it rotates on Torrington roller bearings at each end of the sheave trunnion. These bearings, numbering 16 in all, are of the parallel type working in combination with a roller thrust-unit, and are self-aligning. They are fitted to the outer ring of the radial bearing assembly, the outside diameter of which measures 3 ft. 9 in. It is claimed that use of this type of bearing reduces maximum working effort by 60 per cent compared with bronze bushed bearings.

Control and lifting machinery

The weight of the whole span is balanced to the extent of over 99 per cent by the main counterweights, and as the weight of the ropes is appreciable auxiliary counterweights are used to take care of their unbalanced weight. The vertical movement of the span is controlled by what is known as a "tower drive" system at the top of each tower electrically integrated to ensure that the span always remains truly horizontal.

The main drive consists of adjustable-voltage d.c. motors operating the sheaves through gearing, the motors being synchronised. Current is normally supplied by an a.c. motor-generator set using 4,160/240-V., three-phase, 60-cycle industrial current. The same d.c. supply is used by the control motor generator set. Drive-motor speed is governed by the output voltage of the control generator, itself automatically controlled by an electrical skew-control system. So effective are these controls that the ends of the span are never more than 1 in. out of level.

Locking and interlocking

Complete automatic safety controls, guides and locks are installed to secure the span in both raised and lowered positions. Rail alignment is ensured by a transverse centring shoe and special sliding rail joints. Air buffers are fitted at the top and bottom corners of the span as cushioning against undue shock and to ensure smooth stopping. Interlocking with the railway signals protects rail traffic, and warning lights and audible signals are provided to protect navigation.

As the density of water traffic is greater than that on the railway, the span normally remains raised and is lowered only to pass trains.

The work has been carried out under the general supervision of two successive Chief Engineers of the B. & O.RR. Messrs. K. J. Wagoner and C. R. Riley.

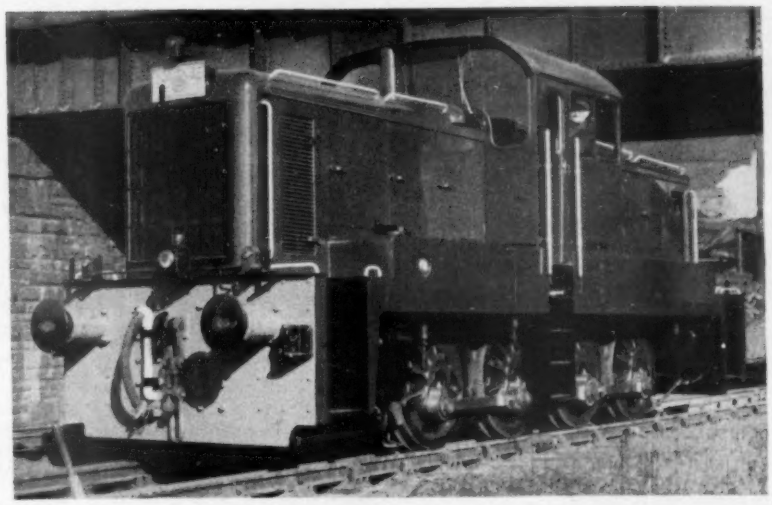
Hydro-mechanical transmissions for dual-purpose locomotives

Differential gearbox fitted to compound the drives on twin-engine diesel-hydraulic locomotives

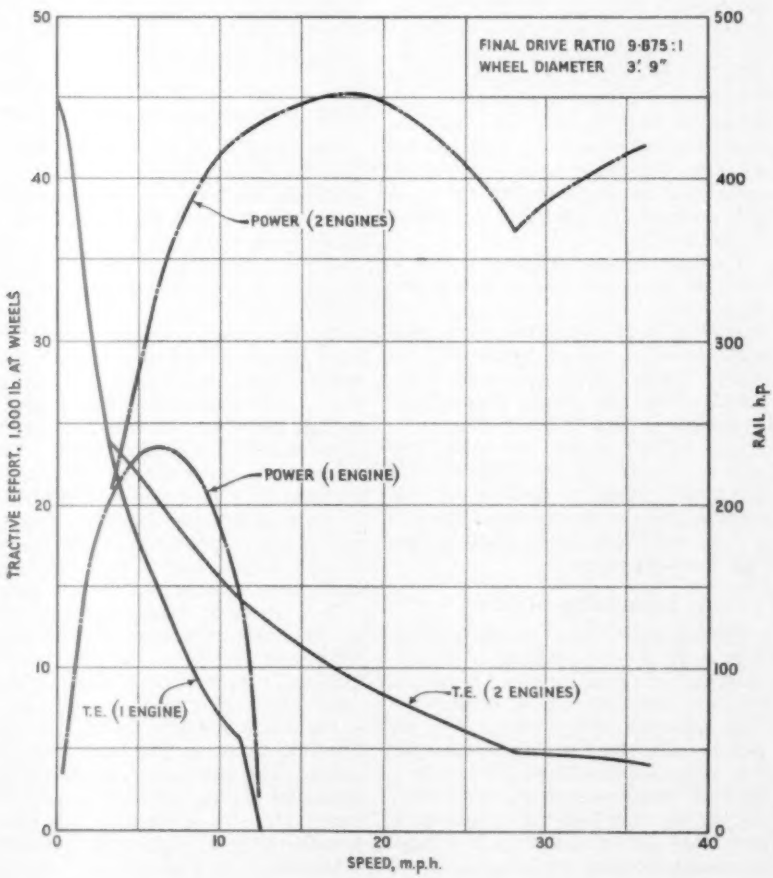
DESIGNED to combine the duties of heavy shunting and transfer or trip working, the Yorkshire Engine Co. Ltd. has recently completed a twin-engine diesel-hydraulic locomotive incorporating a hydro-mechanical transmission.

Engines in opposed positions

The two engines are installed in opposed positions in the locomotive on each side of a central cab, and drive through torque converters into a differential compounding gearbox. When starting-up, one engine only is used and in this condition the differential box provides a reduction ratio of 2 : 1. By this arrangement the power of one engine is sufficient to provide maximum tractive effort for starting and normal shunting. When higher rail speeds are required the drive from the second engine is engaged, this operation being performed without any break in the torque and without manual gear-changing.



(Above): O-D-O twin-engine diesel locomotive with hydro-mechanical transmission
(Below): traction characteristics obtaining from the use of one and two engines



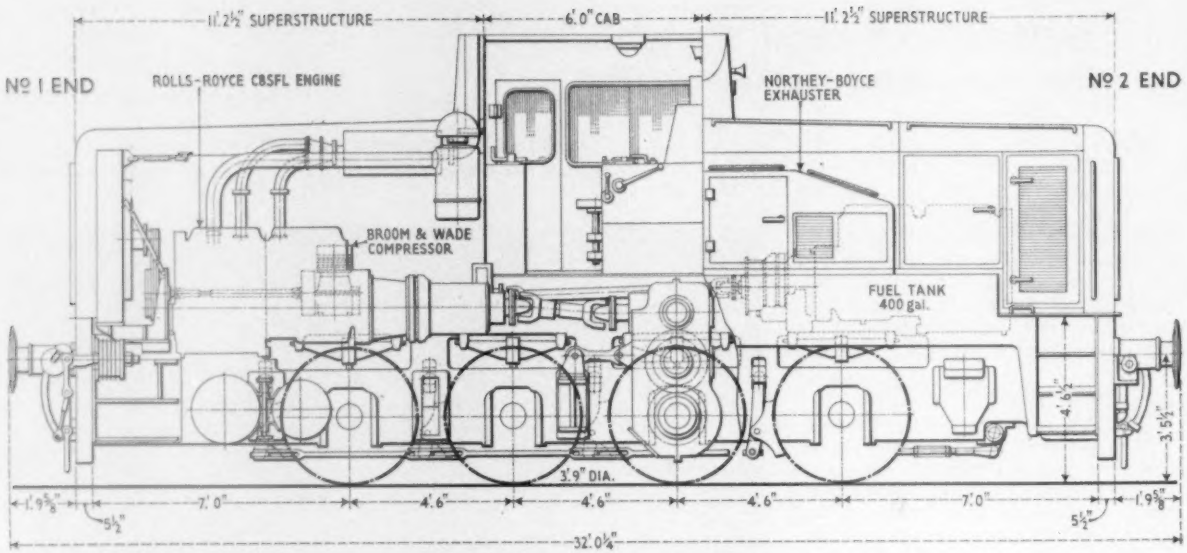
It is claimed that the differential transmission, which has been designed and produced by Rolls-Royce Limited, enables the power and transmission units to operate at maximum efficiency and with substantial reductions in maintenance costs. The central cab layout possible with two small engines provides good visibility, and gives a good distribution of the equipment weight over the axles.

Leading dimensions and data are as follow :—

Gauge	4 ft. 8½ in.
Wheel arrangement	O-D-O
Weight	60 tons
Axle-loading	15 tons
Maximum tractive effort	45,000 lb.
Continuous working range	1-11½ m.p.h. on one engine; 6-36 m.p.h. on two engines
Rating (each engine)	311 h.p. at 1,800 r.p.m.
Final drive reduction	9·875 : 1
Fuel tank capacity	450 gal.
	ft. in.
Length overall	31 5
Width	8 5½
Height over cab	12 2
Wheelbase	13 6
Wheel dia.	3 9

Differential transmission

As shown in the transmission diagram, the compounding gearbox is flange-mounted to the torque converter on No. 1 power unit. The drive from No. 1 converter is fed directly to sun bevel wheel A. The drive from No. 2 converter is fed through spur gears in the ratio of 1·875 : 1 to sun bevel wheel B on the opposite side of the differential. The drive from the differential to the cardan-



Dimensional diagram, showing location of engines and ancillary equipment

shaft coupling is transmitted by three bevel pinions mounted on a spider. When No. 2 engine is not engaged, sun bevel wheel B is prevented from rotating by a sprag-type freewheel.

The throttle lever moves through three positions progressively from "closed" to "idling" and then to "full power." When No. 1 engine is started with the clutch in neutral, movement of the throttle lever from "closed" to "idling" engages No. 1 clutch.

Torque multiplication

Further movement of the throttle lever progressively increases the power, and maximum tractive effort is provided by No. 1 engine and torque converter operating alone. In this condition, the differential gives a torque multiplication of 2 : 1 and, as the torque converter ratio at stalling is about 5 : 1, an overall starting torque ratio of 10 : 1 is available.

The gearing is arranged to permit single-engine working up to a maximum speed of 12 m.p.h., but the drive from No. 2 engine can be engaged at any speed above 3½ m.p.h.

Maximum speed with two engines driving is 36 m.p.h. When No. 2 engine is required for the higher speed range operation, it can be brought in at any position of the throttle, without introducing any torque surge, by operating a separate lever. The power of both engines is then controlled by a single throttle lever. When the throttle lever is returned to the "closed" position, the lever controlling No. 2 engine is automatically disengaged. At a track speed of approximately 28 m.p.h., an automatic control engages the direct drive clutch in No. 2 power unit.

The two Rolls-Royce Type C8SFL power units, rated at 311 h.p. at 1,800 r.p.m., are pressure-charged by Roots gear-driven superchargers. Induction air to the charger is drawn through a heavy duty oil-bath air cleaner, fitted with a centrifuge pre-cleaner and mounted under the bonnet.

Control of the fuel injection pump is by a mechanical all-speed governor. Heat exchanger cooling is provided for the lubricating oil. Each engine is cooled by a thermostatically-controlled Serck radiator fitted with an engine-driven fan. The cooling system is pressurised and automatic warning units are fitted for high coolant temperature and low oil pressure. The torque converter is flange-mounted on the engine and the combined unit is mounted in the frame on resilient mountings.

The three-stage hydrokinetic torque converter flange-mounted on each engine automatically varies the output torque to suit the load applied while maintaining approximately constant load on the engine. These converters are built under licence from the Twin Disc Clutch Company of the U.S.A. The fluid, engine fuel oil, is pumped round the working circuit by an engine-driven centrifugal pump. Cooling of the converter fluid is by circulation through a heat exchanger incorporated in the engine cooling system.

Disconnection of drive

Fitted between No. 1 engine and the Type C.F. torque converter is an air-operated twin-plate over-centre clutch. This allows the engine to be disconnected from the drive when starting-up or for engine testing. On No. 2 engine/converter unit a multi-plate oil-operated clutch is used for disconnecting the drive from the engine. This Type D.F. converter is also fitted with a clutch which engages automatically at a track speed of 28 m.p.h. to provide a direct drive between the converter input and output shafts. A freewheel is incorporated which allows the converter rotor assembly to idle and thus avoid churning losses. In the transmission from each power unit a freewheel is incorporated to permit overrun of the converter rotors by the output shafts on down gradients. This eliminates excessive rotor speeds and consequent overheating of the converter fluid.

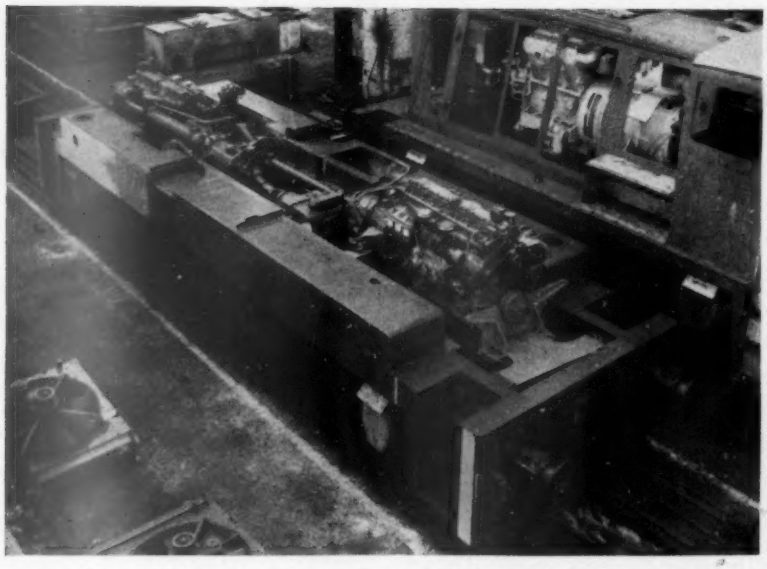
Final drive gearbox

The gearbox is a fixed-ratio triple-reduction unit designed to transmit to a single axle the output of two power units combined in the differential gearbox. Provision is made in the design for the fitting of alternative ratios to provide variations of maximum speed and tractive effort.

The input shaft is integral with a spiral bevel pinion in constant mesh with two bevel wheels mounted on a cross-shaft. Movement of a sliding dog-clutch engages each bevel wheel with the cross-shaft to select direction of travel. The dog-clutch is moved by two air-diaphragm cylinders mounted externally. The cross-shaft drives the axle through a layshaft and case-hardened straight spur gears. Pump lubrication is provided for the taper roller bearings and for the gears.

The fabricated gearcase is anchored to the frame by torque reaction links fitted with Metalastik spherical bushes. Drives for the standstill detector and speedometer are taken from the layshaft.

The driving cab is of double-skin insulated construction with side entrance doors. Large screens are fitted to provide maximum driving visibility in each direction and sliding windows are fitted parallel to the driving seat at each side. Warm air for screen de-misting is supplied



Chassis of locomotive, showing disposition of engines and transmission

by the Clayton cab-heaters and Trico-Folberth wipers are fitted to the screens.

The control desk, carrying the duplicated controls, is arranged against one bulkhead. The reversing lever is interlocked by mechanical and pneumatic devices to ensure that the engines are idling and that the locomotive is stationary before reversal can take place.

The main frame is a bolted assembly of heavy side-plates, fabricated stretchers, and deep buffer beams. Within the limits of the loading gauge, the buffer beams are carried well down to provide protection for the final drive gearbox in the event of a derailment. A riding recess for the shunter is provided behind the buffer beam at each corner of the locomotive. The screwed link couplers and Turton Platts side buffers are of British Railways standard pattern.

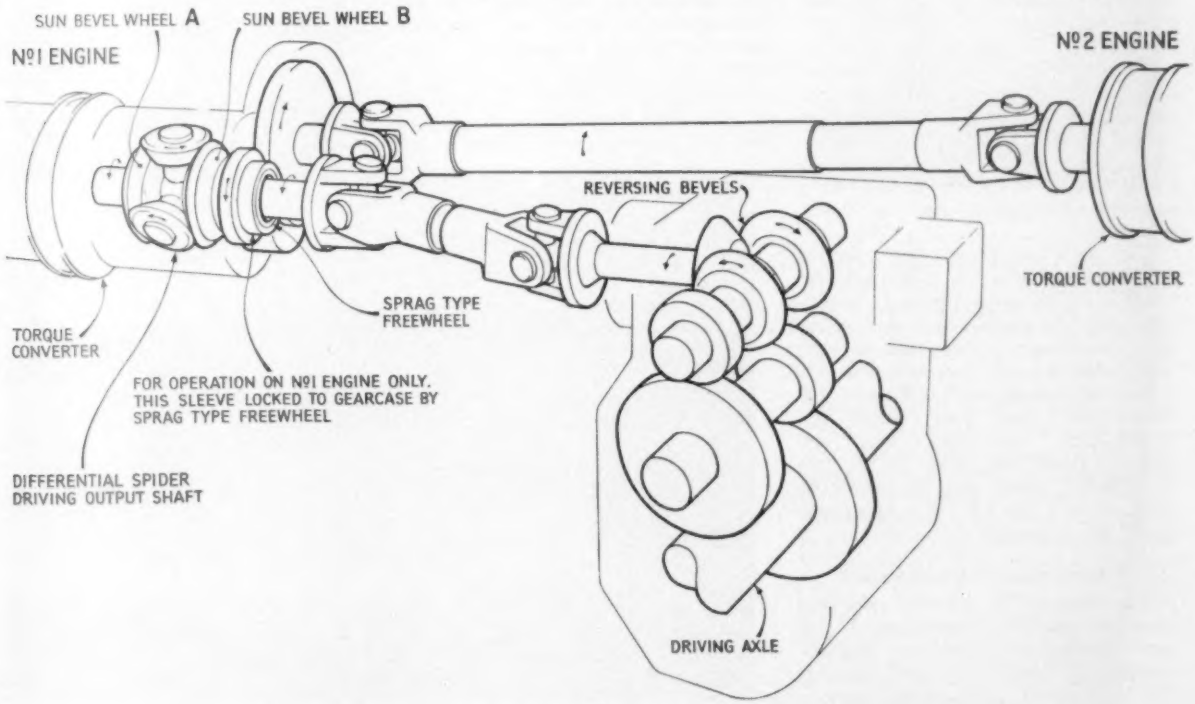
Provision is made for adjustment of the overhung springs. These are located without hangers, in pockets in the frame. Grease-lubricated Timken roller-bearing axleboxes are used, and the boxes and guides are fitted with manganese steel liners. All wheels are coupled with forged-steel rods and the solid-bearing bushes are in leaded phosphor bronze. Sanding is arranged for each direction.

Brake equipment

The Westinghouse air brakes may be controlled by the driver's straight-air brake-valve or by the vacuum brake-valve. Compressed air for the brakes and controls is supplied by a Broom & Wade Type N5 compressor. This is driven by a power take-off from No. 1 engine and has a delivery of 30·4 c.f.m. For vacuum-brake operation, a self-contained exhauster unit is fitted. The Northey 125RE rotary exhauster is driven by a Lister SL3 air-cooled diesel engine. A two-speed control is fitted to enable the exhauster to be run at a moderate speed for maintaining vacuum and to be speeded up for quick brake release.

Sub-contractors include the following:—

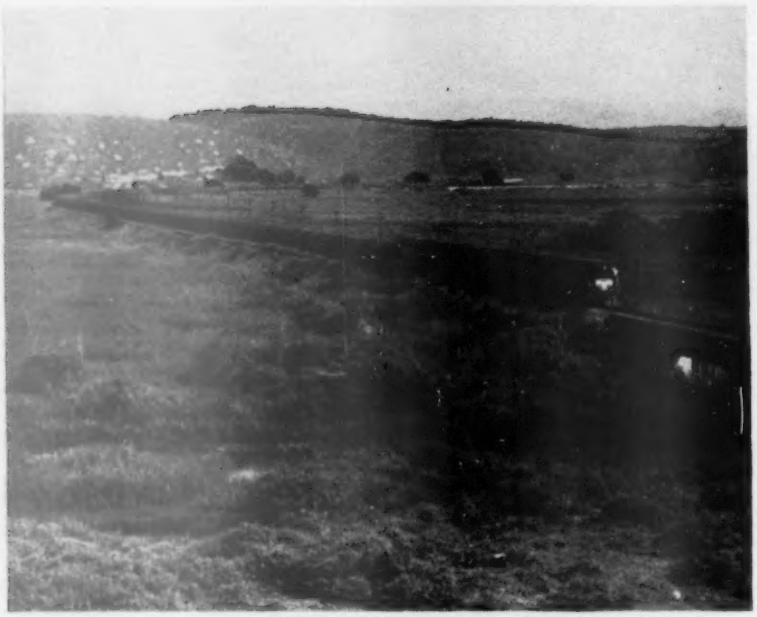
Engines, torque converters, differential and final-drive gearboxes	Rolls-Royce Limited
Radiators	Sereck Radiators Limited
Propeller shafts and universal joints ...	Hardy Spicer Limited
Brake and control equipment ...	Westinghouse Brake & Signal Co. Ltd.
Auxiliary oil engine ...	R. A. Lister & Co. Ltd.
Vacuum exhauster ...	Northey Rotary Compressors Limited
Air compressor ...	Broom & Wade Limited
Buffers	Geo. Turton Platts & Co. Ltd.
Axleboxes	British Timken. Division of the Timken Roller Bearing Company
Resilient mountings and bushes	Metalastik Limited
Windscreen wipers ...	Trico-Folberth Limited
Cab heaters	Clayton Dewandre Co. Ltd.
Battery	D.P. Battery Co. Ltd.



Layout of transmission, showing location of drive relative to twin engines

CARRYING IRON ORE on the Vitória-Minas Railway

Believed to be the heaviest train in the world to have run on narrow gauge



"G.M." diesel-electric locomotives hauling ore train from Itabira

ON FEBRUARY 23 last, the train illustrated on this page made a run over the 570-km. line of the Vitória–Minas Railway, which extends from the Itabira iron-ore deposits in the Estate of Minas Gerais to the port of Vitória in the Estate of Espírito Santo, Brazil. The Vitória–Minas Railway is a subsidiary of the Companhia Vale do Rio Doce S.A., a government-controlled iron-ore export enterprise.

The train comprised five electro-motive (G.M.) Type G-12 diesel-electric "B-B" locomotives operating in multiple and 112 gondola-type ore-wagons of 72 metric-ton capacity and 18 tons tare, followed by an observation car.

The total weight of ore hauled was 8,064 tons. Total gross weight was 10,480 tons. Total length was 1,180 metres. Total time spent on the trip was 16 hr., which gave a commercial speed of 35·7 km.p.h. Top speed sustained was 55 km.p.h.

Westinghouse brake equipment

The five G.M. locomotives were equipped with Westinghouse-type 26-L brake equipment incorporating pressure-maintaining features of great help in the mountainous part of the route.

All the wagons were equipped with Westinghouse AB airbrakes. Airbrakes and signalling equipment are manufactured in Brazil under Westinghouse licence. Brake tests made at Itabira showed a leakage of 2·5 lb. per min. and a gradient of only 3 lb. between lead locomotive and last wagon, which indicates the excellent condition of the brake system.

The wagons, one of which also is illustrated, were of rugged yet lightweight construction. Of Brazilian design and manufacture, they had the following characteristics :—

Capacity	...	24 cu. metres; 72 metric tons of ore
Light weight	...	18 tons
Length between couplers	...	9·7 metres
Couplers	...	Automatic, Type F, interlocking
Bogies	...	Cast steel, ride control type, locally-built Axle journals: 6 in. x 11 in. bearings: roller Wheels: 33 in., type CR, multiple-wear
Brakes	...	ABEL — 7½ x 12 in. empty load, with manual changeover. Built by Freios e Sinais do Brasil S.A. under licence from the Westinghouse Air Brake Company.

The 570-km. track between mine and port includes an 83-km.-long mountain section which includes grades up to—2 per cent in the direction of export. The descent of this grade was made easily and safely at speeds varying between 28 and 42 km.p.h. with the use of maintained light-brake applications and with the locomotives' dynamic brakes.

Series of experiments

This train was the most recent experiment of a series being carried out by C.V.R.D. to determine the most convenient type of train for its purposes. Several experiments have been made during the last three years to determine the most economic type of train for the system's six-million-ton ore transport programme for 1961.

One of the wagons comprising the train

PERSONAL

Overseas

MR. D. B. WATSON, M.C., European Freight Manager, Canadian Pacific Railway, who has retired, joined the Freight Department of the C.P.R. European head office in London, in 1913. On the outbreak of war in the following year, he joined the Middlesex Regiment and attained the rank of Major, won the Military Cross, and was twice mentioned in despatches, before reaching the age of 21. Returning to the C.P.R. in 1921, Mr. Watson rejoined the staff of the European Freight Manager and represented Canadian Pacific interests at freight shipping conferences held in this country and on the Continent. As a Regular Army reserve officer, he was called up in 1939, rejoined his regiment and served with the B.E.F. He was transferred to the Royal Engineers in 1940 and in the following year was given command of a battalion at

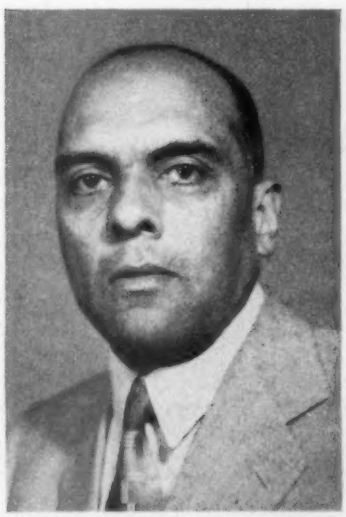
Mr. D. B. Watson

the R.E. depot at Halifax. In 1941 he commanded the Depot Wing R.E. at Longmoor. Mr. Watson returned to the C.P.R. in 1946 and held the position of Assistant General Agent, Liverpool, until he became General Agent, Liverpool. Mr. Watson was appointed European Freight Manager in 1952.

MR. R. R. JAMES, European General Freight Agent, Canadian Pacific Railway, who has been appointed European Freight Manager, joined the Canadian Pacific in London in 1917. He served with the King's Royal Rifle Corps during the 1914-18 war and returned to the C.P.R. in 1919. In 1928 he was appointed Freight Traveller in the European Freight Manager's Department. On the outbreak of the war in 1939 Mr. James was commissioned in the Royal Air Force and served throughout. Returning to the C.P.R. in 1945, he was appointed Assistant to the European Freight Manager and, in 1950, became General Freight Agent in the European head office, the position which he now vacates.

Mr. R. R. James

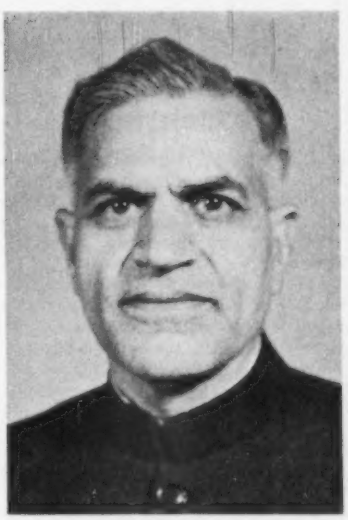
MR. S. P. LAL, Chief Commercial Superintendent, North Eastern Railway, India, who, as recorded in our issue of March 10, has been appointed Chief Operating Superintendent, Northern Railway, was educated at Delhi, and the Lahore Government College. He commenced his railway career with the former North Western Railway in 1932, and attained District rank in 1941. From 1942–45 he was Senior Transportation Officer at the headquarters of the North Western Railway. When India became independent, in 1947, he was working as the Divisional Transportation Officer, Karachi,



Mr. S. P. Lal

and opting for India Mr. Lal was appointed Senior Transportation Officer, Eastern Punjab Railway, Delhi. Two years later he was selected for liaison duty with the Army as Railway Concentration Officer. After three years he was appointed Administrative Officer (Transportation), Eastern Punjab Railway. With the formation of the Northern Railway, in 1952, Mr. Lal became Deputy Chief Operating Superintendent. He was appointed Chief Commercial Superintendent, North Eastern Railway in 1959, the position he now leaves to take up his new appointment.

MR. A. MOHAN, Director (Efficiency Bureau), Indian Government Administration Railway Board, who, as recorded in our March 31 issue, has been appointed Senior Deputy General Manager, Northern Railway of India, was born in 1907. He was educated at Allahabad University and was selected as Transportation Officer in the Superior Revenue Establishment of the Indian Railways in 1930. He joined the former East Indian Railway in 1931, where he gained road-rail experience and later worked as Research Officer. Mr. Mohan transferred to the North Western Railway, in 1940, as Claims Officer, but returned to the East Indian Railway shortly afterwards as Superintendent (Commercial). He became Deputy Director (Traffic), Railway Board in 1944, and joint Director for road-rail co-ordination in 1947. For a brief period he was employed on the Assam Railway and in 1951, again returned to the East Indian Railway as Divisional Superintendent before becoming Director, Railway Movement, Calcutta. He subsequently became Chief Commercial Superintendent, Eastern Railway and then Chief Operating Superintendent. Mr. Mohan was appointed Director (Efficiency Bureau), Railway Board in 1960.



Mr. A. Mohan

MR. H. ARKLE, Managing Director, Europe, of the Canadian Pacific Railway Company, has been elected a Director and Chairman of the company's subsidiary Canadian Pacific Steamships Limited. MR. D. K. BUIK has been appointed Managing Director of the same subsidiary and both will have their headquarters in London, MR. J. R. Y. JOHNSTON has been appointed Manager for Canada.

Industrial

MR. J. H. HIRST, managing director of Hirst Ibbetson & Taylor Limited, has been elected President of the Electrical Wholesalers' Federation for 1961-62.

British Insulated Callender's Cables Limited, has announced the formation of a new company, Telcon Plastics Limited. From April 1, 1961, this company, centred at Green Street Green, Orpington, Kent, will take over the entire range of activities of the Plastics Division of the Telegraph Construction and Maintenance Co. Ltd. The Board of Directors of Telcon Plastics Limited will be constituted as follows: MR. W. C. SMITH, Chairman; MR. J. L. FERGUS, General Manager; MR. D. NORMAN-THOMAS and MR. H. F. WILSON. The Company Secretary will be MR. L. G. F. SLINEY.

British Transport Commission

British Transport Advertising, the British Transport Commission's advertising service has been established as a separate division under a Board of Management. The members of the new board are: MR. J. H. BREBNER (Chairman); MR. G. DODSON-WELLS, Chief Commercial Advertising Officer; MR. J. L. PERREN, Commercial Advertising Officer, and MR. H. W. DENHAM, Accountant. Mr. BREBNER's biography appeared in our issue of March 31.

MR. C. R. DALBY, Head of Sales and Development Section, Line Traffic Manager's Office, Liverpool Street, British Railways, Eastern Region, has been appointed Commercial Officer (Ipswich Area).

MR. D. J. REYNOLDS, Principal Scientific Officer, Department of Scientific & Industrial Research, British Transport Commission, has been appointed Senior Costings Officer.

MR. R. J. POWELL, M.INST.T., District Operating Superintendent, Nottingham, who, as recorded in our April 7 issue, is to retire, began his railway career on the former Glasgow & South Western Railway in 1912, and was transferred to the office of the Superintendent of the Line at Glasgow (St. Enoch) in 1915. After service in the Navy from 1916 to 1919, he returned to the same office and, in 1923 was transferred to the London Midland & Scottish Railway's headquarters at Glasgow, where he held various appointments in the Divisional Control and the Divisional Trains Office. In 1939, Mr. Powell acted as Outdoor Assistant to the District Goods & Passenger Manager, Ayr, and, in 1944, was appointed Assistant District Goods & Passenger Manager, Perth. In 1946, he became District Controller, Carlisle. On nationalisation in 1948, Mr. Powell became

Mr. R. J. Powell

Assistant District Traffic Superintendent, Carlisle, and, in December, 1948, was appointed District Operating Superintendent, Barrow. In 1952, he was transferred to Derby in a similar capacity. Mr. Powell became District Operating Superintendent Nottingham (Midland), in 1954, and when the penetrating lines were abolished in 1956, he took charge of the combined Nottingham (Midland) and Nottingham (Victoria) Districts, from which position he is now retiring.

MR. S. HARDY, DIPL. ARCH., A.R.I.B.A., Sectional Architect, Chief Civil Engineer's Office, York, British Railways, North Eastern Region, who has been appointed to the position of Architect, was educated at Castleford Grammar School and Leeds School of Architecture. He commenced his railway career in 1953, in the Civil Engineer's Department, as a Leading Assistant Architect and subsequently became Senior Assistant Architect and then Sectional Architect. Mr. Hardy was associated with the development of new signalboxes at Huddersfield and Newcastle, and the staff and amenities block in the new Motive Power Depot at Thornaby.

Mr. S. Hardy

Combustion Engineering Association

The Council of the Combustion Engineering Association has appointed the following to hold office for the year 1961-62: President, MR. N. A. MCNEILL, Unilever Limited; Vice-Presidents: MR. S. P. CHAMBERS, Imperial Chemical Industries Limited; SIR JOHN CHARRINGTON, Charrington, Gardner, Locket & Co. Ltd.; MR. G. D. ELLIOTT, John Thompson (Australia) Pty. Limited; BRIGADIER K. HARGREAVES, Hargreaves (Leeds); MR. H. C. HAWKINS, the British Xylonite Co. Ltd.; SIR EDWARD THOMPSON, John Thompson Limited; MR. B. E. A. VIGERS, Laporte Industries Limited; MR. F. WILKINSON, National Coal Board. Chairman of the Council, MR. M. S. GASKILL, West's Gas Improvement Co. Ltd.; honorary treasurer, MR. E. W. BARNES, Riley (IC) Products Limited. Brigadier Hargreaves and Mr. F. Wilkinson are new appointments.

Obituary

We regret to record the death, on February 26, at the age of 91, of MR. E. H. DAVIES, formerly Assistant Chief Goods Manager, London Midland & Scottish Railway. Mr. Davies joined the London & North Western Railway in 1884 as an apprentice clerk and in 1896 was appointed Goods Agent, Edge Hill, and later Assistant District Goods Manager, Birmingham. During the 1914-18 war he was seconded to the Civil Service and became Chief of Supplies, Coal Control. After the war he returned to the railway at Euston and later became Assistant Chief Goods Manager.

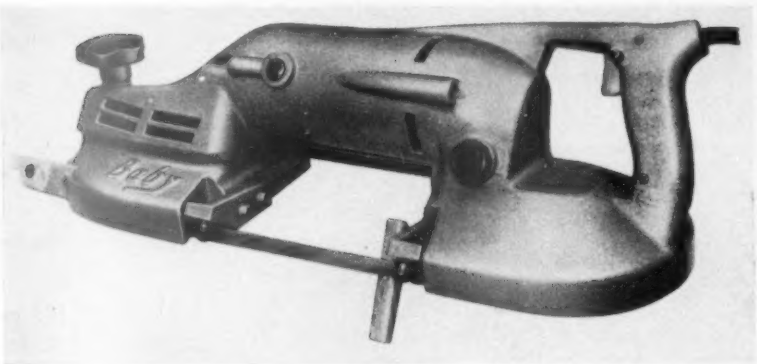
We regret to record the death, on April 1, at the age of 67 of MR. J. H. WELLS, formerly Public Relations Assistant, Paddington, British Railways, Western Region. Mr. Wells entered the service of the Great Western Railway in 1909 in the Advertising Department. After service in the 1914-18 war he spent some time in the Office of the Superintendent of the Line and returned to the Advertising Department in 1920. He became Chief Clerk, Publicity Department, in 1945, and on the establishment of the Public Relations & Publicity Department, in 1949, was appointed Public Relations Assistant.

We regret to record the death, on April 4, at the age of 83, of SIR ALEXANDER ROGER, K.C.I.E., honorary President and former Chairman of British Insulated Callender's Cables Limited.

Erratum

In our April 7 issue we gave the previous appointment of MR. P. W. GLASSBOROW, Traffic Survey & Costing Officer, Liverpool Street, British Railways, Eastern Region, as "Economics Officer, Finance Department, British Transport Commission," this was incorrect. Mr. P. W. Glassborow entered the railway service in the capacity of Traffic Survey & Costing Officer, Liverpool Street.

NEW EQUIPMENT *and Processes*



PORTABLE BANDSAW

A portable metal-cutting bandsaw has been introduced by Soag Machine Tools Limited.

Despite its low weight of 21 lb. this saw is capable of cutting through mild-steel bar of 1½ in. dia. in 80 seconds. Cutting speed is 115 ft. a minute. Capacity is up to 2½ in. dia. on bar and up to 4½ in. by 3 in. on profiled material.

Drive is from a ⅓ h.p. motor through hardened helical gears. The high-speed blades are easily changed, tension being released by a half-turn of a button.

The current required is 220/250 V single-phase. Overall dimensions are 21½ in. x 7½ in. x 6¾ in.

Extras available enable the machine to be converted to a fixed vertical or horizontal bandsaw, and guide rollers may be obtained for use when slitting.

The machine is priced at £56. Further information is available from the maker, Juxon Street, Lambeth, London, S.E.11.

DEHUMIDIFIER

"Hygro - Robot" series A.492 dehumidifiers have been introduced for the purpose of keeping warehouses and factories dry, and are also suitable for drying out new buildings.

The machines are available in three types to suit various ranges of ambient temperatures, namely, +12 deg. C. to +30 deg. C., +5 deg. C. to +40 deg. C., and −10 deg. C. to +40 deg. C. respectively.

The method of operation is based on the cooling technique. Air is drawn into the machine by a fan and cooled below dew point, the water-vapour in the air being thus condensed. The condensate is led by hose-pipe to a suitable drainage point.

The equipment includes a high-performance, completely-enclosed motor-compressor unit of 1·5 b.h.p., built into a hermetically-sealed casing, where it is automatically lubricated and cooled in an oil-bath.

The machine is housed in a steel cabinet and secured to a welded angle-iron base, mounted on strong castor wheels to allow easy manoeuvrability within buildings.

The normal range of operation is from 40 to 100 per cent relative humidity, but a special version is available with a range of 30 to 100 per cent relative humidity where required. The dry air delivery is approximately 63,000 cu. ft. per hr. The compressor motor is designed to operate on an A.C. three-phase supply, and its power consumption is approximately 1·1 kW.

The overall dimensions of the machine, including base, are 3 ft. 3 in. x 3 ft. 3 in. x 3 ft. An alternative version, Series A.493, has a modified layout to enable the machine to pass through narrow doorways. Its dimensions are: length 3 ft. 3 in., width 1 ft. 8 in., and height 3 ft. 9 in.

Further details may be obtained from British Sarozal Limited, 22, Berners Street, London, W.1.

EARTH LEAKAGE CIRCUIT BREAKER

The Chilton type C earth-leakage circuit breaker, conforming to B.S. 842, is designed for the automatic protection of the consumer from electric shock as the result of the breakdown of the wiring system in a building.

The circuit-breaker is of the double-pole, voltage-operated type.

Advantages claimed for the unit include ratings up to 100 amp. provided for in a single frame size; high sensitivity, resulting from designed low-current operation; reversible mains wiring, enabling connection by top or bottom terminals.

Further details may be obtained from Chilton Electric Products Limited, Hungerford, Berks.

LORRY-MOUNTED CRANE

The Mark II Lorry Loader crane is an improved version of this type of crane introduced by R. H. Neal & Co. Ltd. It is designed for mounting on a lorry to give independent facilities for loading and unloading, and can be operated by the driver.

The new features of the Mark II crane include the provision of an articulating jib operated by a double-acting hydraulic ram, and the ability to execute all movements of slewing, derricking, and jib articulation either independently or simultaneously.

Construction is of fabricated steel pressings and seamless tubes. The pressed steel, articulating jib has an additional telescopic extension, manually operated to give a maximum outreach of 11 ft. 2 in.

Hydraulic power is provided by an oil pump, driven from a power take-off on the vehicle gear-box. Control is by three levers, which can be operated either independently or simultaneously.

At the mounting position of the crane on the vehicle, the chassis is suitably strengthened and braced, and a hydraulically-operated support leg is also provided to relieve the chassis and springs when loads are being handled.

Maximum lifting capacity is one ton at 5 ft. 5 in. radius, and 7 cwt. at the maximum radius of 11 ft. 2 in.

Further details may be obtained from The Steel Group of Companies, Crown Works, Sunderland.

ECCENTRIC-DRIVEN PRESS

Torc-Pac O.B.I. presses, designed by the Clearing Division of U.S. Industries, Inc., Chicago, U.S.A., are now produced in this country by Vickers-Armstrongs (Engineers) Limited, Crayford, Kent. They are available in three sizes, of 22, 32, and 45 tons capacity respectively.

The frames are of all-steel welded construction, designed to withstand deflection under load. The sealed drive unit, situated between the frame side members,

incorporates an air-operated friction clutch and brake, which does not require adjustment. The clutch and brake, flywheel bearings, and gearing run in oil. The clutch engagement is started by trapped oil which is placed in shear, a method which minimises the amount of wear on the sintered-bronze friction plates, which are unaffected by high temperatures. The clutch and brake are mechanically interlocked to prevent simultaneous engagement.

The 22-ton and 32-ton presses are powered by 2 h.p. and 3 h.p. motors respectively, arranged for running either at various fixed speeds or at variable speed. The 45-ton type is driven by a 5 h.p. motor, arranged to operate at various fixed speeds only.

The drive from the clutch shaft is taken through a reduction gearbox to an eccentric shaft, whose bearing supports are located close to the eccentric. The shaft projects through the front housing to give a power take-off for slide feeds, etc., and is fitted with an adjustable cam to operate a limit switch.

The pitman has a forked lower end, to which is fitted a thick plate. A pitman extension passes through this cross-piece and is secured in position by lock-nuts at top and bottom. The deep upper nut is calibrated in 0·001 in. divisions for accurate slide setting. The slide runs in vee-ways with one fixed and one adjustable gib strip.

The electrical control gear, which operates on 110 V., is housed in a dust- and oil-tight cabinet.

Bed and bolster dimensions for the three types are 21 in. x 11 in., 24 in. x 15 in., and 28 in. x 18 in. respectively. All sizes can be provided with any one of four stroke lengths, the maxima being 4 in., 5 in. and 6 in., in relation to the capacity of the press.

Further details may be obtained from the sole selling agents in this country, Rockwell Machine Tool Co. Ltd., Welsh Harp, Edgware Road, London, N.W.2.

SILICONE COMPOUND

Midland Silicones MS4 is a silicone compound suitable for a wide range of applications, particularly electrical.

It is non-melting and retains a grease-like consistency in temperatures ranging from −50 deg. C. to 200 deg. C. It has good dielectric characteristics, high water-repellent properties, and resists oxidation.

MS4 compound is used as a dieletric potting material for transistors and for filling sleeves covering wire connections in telecommunications equipment. It is also employed as an auxiliary dielectric in petrol-engine ignition systems. Further uses are as a lubricant for electrical contacts, meter bearings, and other small mechanisms.

This silicone compound acts as a seal against ingress of moisture for electric heating elements, and plugs and sockets.

Among other uses is that of a corrosion inhibitor on battery terminals, leads, and most equipment exposed to wet and corrosive conditions. With zinc dust added in the proportion of 1 : 4, the compound, when applied to components of outdoor switchgear, is claimed to give adequate conductivity and protection against oxidation for two or three years.

Employed as a release agent against ice, it enables outdoor switchgear to be operated without difficulty under icing conditions.

Further details may be obtained from Midland Silicones Limited, 68, Knightsbridge, London, S.W.1.

WELDING ELECTRODE

Inco-Weld "A" has been introduced to surmount the problem of selecting a suitable filler material for welding dissimilar metals.

A dissimilar weld may contain both the filler metal and substantial quantities of the base materials being joined. Accordingly, a high degree of metallurgical compatibility is desirable between the filler metal and both base metals.

To meet the requirement Inco-Weld "A" electrode and filler wire has been introduced by Henry Wiggin & Co. Ltd., Thames House, Millbank, London, S.W.1. Full particulars are available on application.

UPHOLSTERY SHAMPOO

A new carpet and upholstery shampoo has been introduced under the trade name of "Hifoam."

It has been formulated to produce high-foaming, for surface cleaning, without undue wetting. This results in minimum penetration to the back of the fabric or carpet, obviating rotting of material and floor boards.

The fast-drying properties of this preparation enable coaching stock to be returned to traffic with little delay.

Further information is available from the maker, Reddish Detergents Limited, Cheadle, Cheshire.

HYDRAULIC BENCH-PRESS

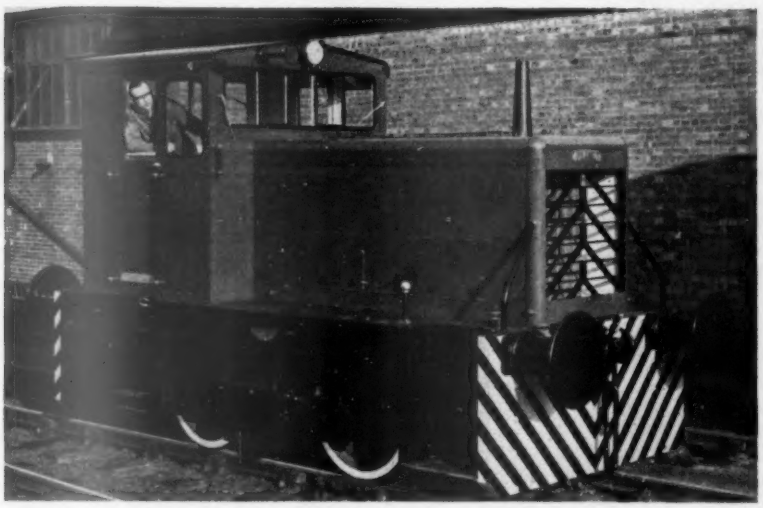
Tangyes Limited market the "Hydrapak" hydraulic hand-pump, giving two speeds, provided by different-sized plungers. The plunger gives pressures up to 750 lb. sq. in. and the other up to 10,000 lb. sq. in. This unit has now been incorporated in a small down-working bench-press with a capacity of 10 tons.

The ram is of 2½ in. dia., and the stroke 5 in. The work table, with an area of 13 in. x 10 in., is 11 in. from the bottom of the ram when in the fully-retracted position.

Three strokes of the pump-operating lever, with the pump set in the lower-pressure position, will move the ram 1 in. This setting is suitable for pressures up to about 2½ tons, or when quickly advancing the ram to the work. On the higher-pressure setting, approximately 17 strokes are required for each 1 in. movement of the ram.

Fuller information is available from the maker, Cornwall Works, Smethwick, Birmingham.

EQUIPMENT *at the Engineering Exhibition*

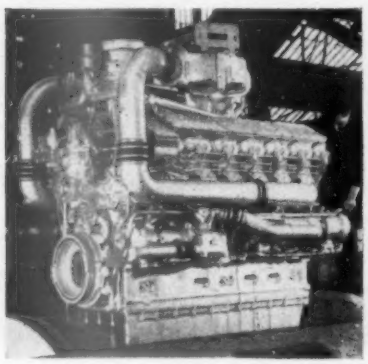


LOCOMOTIVE

A " Planet " 0–4–0 diesel-hydraulic locomotive, produced by F. C. Hibberd & Co. Ltd., 56, Victoria Street, London, S.W.1., will be seen on the stand of British United Traction Limited at the forthcoming Engineering, Marine, Welding & Nuclear Energy Exhibition at Olympia. It has a B.U.T. " 680 " six-cylinder direct injection engine, producing 163 b.h.p. on a one-hour rating, at 1,800 r.p.m. Power transmission is by a " Twin Disc " three-stage torque converter. The locomotive has a starting tractive effort of 13,500 lb. and a maximum speed of 16 m.p.h.

DIESEL ENGINES

On the Bristol Siddeley stand three Bristol Siddeley Maybach high-speed diesel engines for rail-traction use will be seen. These are the " MD330 " in-line six-cylinder engine, the " MD655 " V-type 12-cylinder, and the "MD870 " 16-cylinder types. The two latter engines are production ones, built at Ansty, near Coventry, for British Railways' " D800," and Type " 3 " diesel-hydraulic locomotives. Ninety-five of the last-mentioned are under construction by Beyer, Peacock (Hymek) Limited.



In addition British United Traction Limited, 96, Piccadilly, London, W.1, is exhibiting several examples of diesel engines and transmission equipment for installation in railcars and multiple-unit trains,. There will be a series " 902 " 15-litre, six-cylinder engine, horizontally-disposed for under-floor mounting, developing 230 b.h.p. at 1,900 r.p.m. Normally-aspirated engines of this type are in service with British Railways, the Southern and Northern Railways of India, and the Nigerian Railways. The latest application is to B.R. " Trans-Pennine " Inter-City trains between Liverpool, Manchester, Leeds, and Hull.

A vertical part-sectioned 18-litre normally-aspirated six-cylinder engine, with an output of 275 b.h.p. at 1,900 r.p.m. is intended for shunting-locomotive applications. Similar engines are installed in Netherland Railways' railcars.

Among the exhibits on the stand of Davey, Paxman & Co., Ltd., Colchester, is a type " 6ZHXL " direct-injection horizontal engine, initially developed for rail-traction purposes. This single-bank design is pressure charged and develops 450 b.h.p. at 1,500 r.p.m.

INJECTION EQUIPMENT

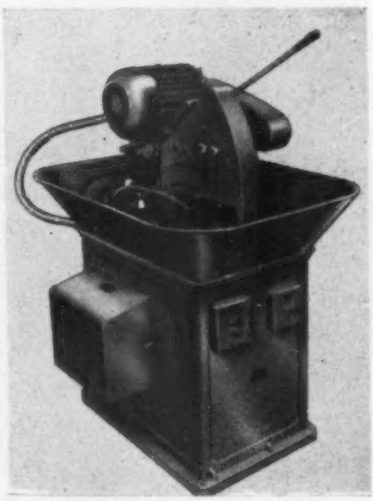
A comprehensive range of fuel injection equipment will be shown by Bryce Berger Limited, Hucclecote, Gloucester. Exhibits will include a governor for engines of from 500-5,000 h.p., and a combined pump and injector, particularly suitable for high-speed engines.

Also on view at the Engineering Exhibition will be an accumulator pump for free-piston gasifyers and a handraulic starter. The latter is a simple pneumatic-hydraulic device available in two sizes, the larger of which is suitable for engines up to 6¼ in. bore.

MACHINE TOOLS

Abrasive-wheel cut-off machines and sawing machines will be shown by A. & S. Osmond Ltd., 13, Dowry Square, Bristol.

The abrasive wheel cut-off machines are intended for rapidly cutting both ferrous and non-ferrous bars, tubes, angles, and sections. The sawing machines are constructed for high rates of production on non-ferrous material.



INSTRUMENTS

An extensive range of dial thermometers, recorders, and controllers will be on the stand of the British Rototherm Co. Ltd., Merton Abbey, London, S.W.19.

These will include a high-temperature thermometer for diesel engine use, distant-reading thermometers, and rigid-stem models.

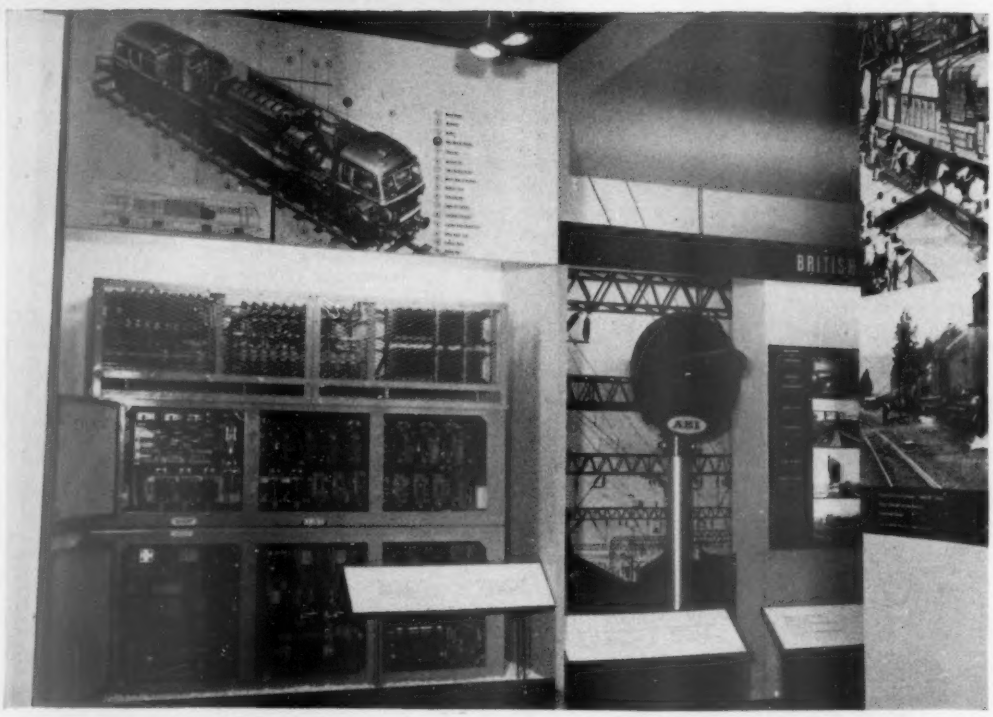
Temperature recorders, and pressure recorders will be of the single and dual-pen types. Other products on show will include pressure, vacuum, altitude and hydraulic gauges available with dials from 2½ in. to 8 in. dia.

RAND SHOW JOHANNESBURG

The United Kingdom pavilion at the Rand Easter Show

Entrance to the L.A.M.A. rail-transport exhibit in the U.K. pavilion

A section of the rail-transport exhibit showing the Brush Electrical Engineering Company's control cubicle for a British Railways Type 2 diesel-electric locomotive

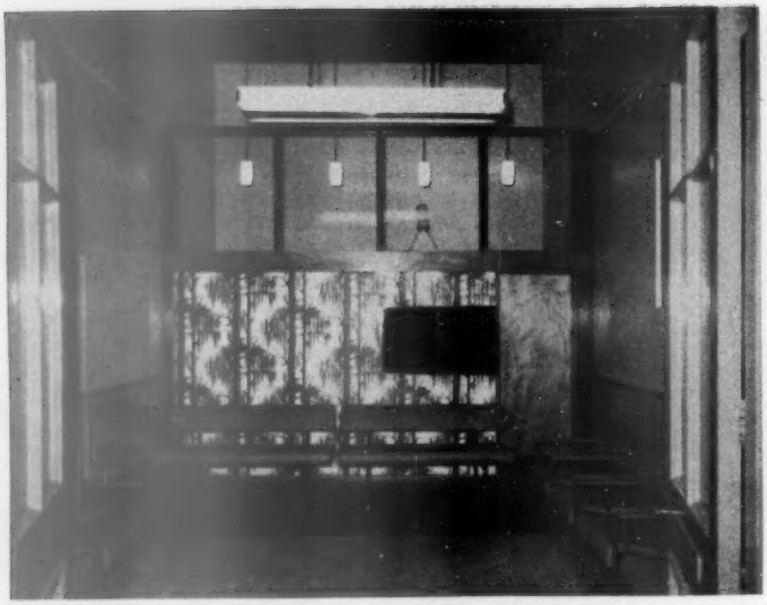


A section of the rail-transport exhibit illustrating British Railways modernisation

Group at the trade party held in the U.K. pavilion, March 21. (Left to right): Mr. R. E. Ketley, Hunslet Taylor Consolidated (Pty.) Ltd.; Mr. E. S. Cox, Assistant Chief Mechanical Engineer, B.T.C.; Dr. L. Douglas, Assistant General Manager (Technical), South African Railways; Mr. G. Collingwood, Chairman of L.A.M.A. and Managing Director, Vulcan Foundry Limited, and Mr. G. Holden, English Electric Co. of South Africa (Pty.) Ltd.

Mr. Collingwood speaking at the banquet given March 23, at the Carlton Hotel, Johannesburg, by the British Manufacturers & Representatives Association, South Africa. On Mr. Collingwood's right are the President of the B.M. & R.A.; Mr. J. Davison, Hawker Siddeley Brush (S.A.) Ltd., and the Hon. W. H. Eastwood, Minister of Transport, Federation of Rhodesia & Nyasaland. On Mr. Collingwood's left is Mr. D. A. Bryan, U.K. Senior Trade Commisioner

The Hon. W. H. Eastwood (on left), discussing the rail-transport exhibit with (left to right) Mr. W. Battams, British General Electric Co. (Pty.) Ltd., and Mr. K. A. Huggins, U.K. Trade Commissioner, Johannesburg



Improved toilet facilities at Bradford

The ladies' waiting room at Bradford Exchange Station (illustrated above) has been remodelled, modernised, and refurnished.

Part of a comprehensive and progressive scheme to improve passenger amenities at Bradford Exchange Station, the modernisation is an answer to criticism levelled during an open forum held by the North Eastern Region of British Railways in Bradford last year.

Double swing doors lead into a room decorated in yellow-grey, and blue-grey ceiling. Rust-coloured upholstery on chairs and settees tones with woodwork of makore, an African hardwood with a rich mahogany tone. The frameworks of doors and windows are painted to match the walls and doors are of polished natural wood.

Toilet accommodation includes wash basins and mirrors lit by pendant glass-shaded lights. Roof-extractor ventilators give ventilation. Plastic-faced hardboard provides hard-wearing and easy-to-clean surfaces.

Charcoal grey linoleum throughout, with a blue-green inset in the waiting room, completes the transformation.

The room was designed in the Architect's Section of the Chief Civil Engineer's Department of the North Eastern Region, York, to whose direction the work was carried out by F. & J. Watkinson Limited of Bradford.

Transport museum

A section of the Museum of British Transport—the first permanent exhibition in the country devoted entirely to the history of public transport by rail, road and water—has been opened at Clapham, London. The new museum has been established by the British Transport Commission for the preservation and display of a large selection of its historical treasures. Many of these were collected by the former railway companies and other independent transport undertakings, while others were given by members of the public for preservation. Since 1951, when the Commission appointed a Curator to supervise the gathering of material of historical interest, the collection has greatly increased until it is now the largest of its kind in the world.

The first section of the museum contains models, pictures, maps, crests, tickets, timetables, uniform buttons, badges, posters, and many other small items tracing the evolution of transport through two centuries. Larger relics, including locomotives, Royal railway carriages, buses, trams and canal craft, are being assembled but will not be ready for public display until a much later date. The exhibits now on view are presented in show cases with built-in lighting, and attractive photostat enlargements of transport scenes are used as a general background.

Apprentice-built model locomotives

Two fine models of the famous Great Western steam locomotive "The Great Bear" and a Lancashire & Yorkshire locomotive of 1899, which were built by trainees at the apprentices' training school at Crewe as an exercise in locomotive engineering, are on display. There is also a small gallery entitled "London on Wheels." Here are models of quaint buses and trams which were once a familiar sight on London streets. Among them are Shillibeer's horse-bus of 1829—the first in London, the Tilling "knifeboard" horse-bus of 1851 with its "decency screens" to hide the ladies petticoats, and the London General Omnibus Company's garden-seat horse-bus of 1886.

The staircase and landing form a single gallery depicting Royal railway travel of bygone days.

In the main gallery are numerous models of historic locomotives, rolling stock, cross-channel steamers and canal vessels; plate and glassware from early railway refreshment rooms, including one of the first electric kettles, dated 1897, and large collections of railway tickets and passes. Of particular interest are models of the locomotive "Wildfire," built by Robert Stephenson in 1837 for the Grand Junction Railway, and the L.N.W.R. paddle steamer "Rose" which was built in 1876 for the Holyhead and Dublin service. There is also a working model of the Stephenson link-motion—which controls the expansion of steam in locomotive cylinders and is still used in British locomotives today.

The museum is open to the public from 10 a.m. to 5.30 p.m. on weekdays, and the admission price is 1s. for adults and 6d. for children.

Staff & Labour Matters

National Council for the Omnibus Industry

As a result of correspondence which has passed between the two sides, a special meeting of the National Council for the Omnibus Industry was held in London on April 5, to hear submissions from the trade union side in respect of claims renewed in the terms of the trade union applications of November 11, 1960.

The claims affect some 100,000 workpeople in the provincial bus industry employed by private bus companies and undertakings controlled by the British Transport Commission.

After presentation of the claims and consideration by the employers' side, the employers offered to refer the matter to arbitration. The trade union side requested that the claims be negotiated within the Council forthwith. The employers did not accept this, At the request of the trade union side it was agreed that the Council adjourn to allow the union representatives to consult their respective executives.

Provincial bus workers

On April 10, the leaders representing the provincial bus workers met to decide whether to go ahead with their plans for taking strike action.

The National Union of General & Municipal Workers, the A.E.U., and the Transport & General Workers' Union have endorsed the proposal for strike action. The other three unions concerned—the N.U.R., National Union of Vehicle Builders, and the E.T.U.—have not yet announced their decisions.

The meeting of union leaders on April 10 decided to agree to another meeting with representatives of the employers and efforts were made to fix this meeting for today, Friday, April 14.

Although the union leaders have not disclosed what line of action they propose to take, one likely step is that it will be agreed to refer the men's claim to arbitration.

"Caledonian Princess"

A new ship, the "Caledonian Princess," was launched at the Leven Shipyard of William Denny & Sons Ltd., Dumbarton, on April 5. The ceremony was performed by Mrs. D. H. Cameron of Lochiel, wife of the Chairman of the Scottish Region Area Board of the British Transport Commission, watched by many distinguished guests including Sir Daril Watson, member of the B.T.C. Shipping Advisory Council, and

Mr. James Ness, General Manager of the Scottish Region of British Railways and Chairman & Managing Director of the Caledonian Steam Packet Co. (Irish Services) Ltd., the owning company.

Accommodation

The new ship will carry 1,400 passengers, 103 motor vehicles and 40 motor cycles and bicycles, as well as cargo. She will have a crew of 77. The ship will be fitted with Denny-Brown stabilisers to ensure a smooth crossing between Stranraer and Larne, on which service she will be employed. A special feature is the bow lateral-thrust unit, a cycloidal propeller in the bow, to assist manoeuvring when entering and leaving port. Her interior appointments will include lounges, smoke-rooms, bars, ladies' rest-rooms, a restaurant & cafeteria, and first and second-class cabins, including two cabins-de-luxe.

CONTRACTS & TENDERS

Wilson Lovatt & Sons Ltd. has commenced work on the £300,000 Banwen, South Wales, disposal point contract for the National Coal Board Opencast Executive. The work comprises dismantling and re-erection of a washery and screening plant, together with extensive railway sidings, road works, and a wagon tippler.

BOARD OF TRADE

The Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Sudan:

1 combination turret lathe, motor driven, to take bars of 2½ in. dia.

The issuing authority is the Office of Controller of Stores, Stores Department, Sudan Railways, Atbara, Sudan, to which bids should be sent. The tender No. is 2356. The closing date is May 31, 1961. The Board of Trade reference is ESB/11838/61.

1 motor driven heavy duty axle journal re-turning and burnishing machine.

The issuing authority is the Controller of Stores, Sudan Railways, Stores Department, Atbara, to whom bids should be sent. The tender No. is 2362. The closing date is May 15, 1961. The Board of Trade reference is ESB/11831/61.

1 motor driven 20 in. band sawing machine, the machine shall be supplied complete with three spare band saw and electric motor and control gear suitable for operation on 415 V. three-phase 50 cycle a.c. The electrical equipment shall comply with the details shown in the S.G. specification 541 amended.

The issuing authority is the Office of the Controller of Stores, Sudan Railways, Atbara, to which bids should be sent. The tender No. is 2360. The closing date is May 8, 1961. The Board of Trade reference is ESB/10894/61. No further information is available at the Board of Trade.

1 magnetic separator for brass, steel, and white metal turnings. The machine shall be mounted on wheels. Electric supply available is 415 V. three-phase 50 cycle a.c. Electrical equipment shall comply with details shown in S.G. specification 541 amended.

The issuing authority is the Office of the Controller of Stores, Sudan Railways, Atbara, to which bids should be sent. The tender No. is 2361. The closing date is May 11, 1961. The Board of Trade reference is ESB/10895/61. No. further information is available at the Board of Trade.

From Greece :

19,000 kg. Calcium Carbide granulated, in pieces of 50-80 mm., maximum percentage of powder and other mixtures 5 per cent, guaranteed for a gas yield of 300 litres of acetylene gas per kg. under normal temperature and pressure 760 mm. of mercury, with tolerance 5 per cent.

The issuing authority is the Hellenic State Railways, Purchasing & Stores Department, 34 Themistocleous Street, Athens, to which bids should be sent. The tender No. is 5018. The closing date is April 25, 1961. Local representation is essential. The Board of Trade reference is ESB/11807/61.

250 electric, three-colour hand lamps, as per specification.

The issuing authority is the Hellenic State Railways, Purchasing & Stores Department, 34 Themistocleous Street, Athens, to which bids should be sent. The tender No. is 5019. The closing date is May 5, 1961. Local representation is essential. The Board of Trade reference is ESB/11802/61.

20 rail motor gang trolleys

3 heavy duty rail motor-cars.

The issuing authority is the Hellenic State Railways, Purchasing & Stores Department, 34 Themistocleous Street, Athens, to which bids should be sent. The tender No. is 4980. The closing date is May 9, 1961. Local representation is essential. The Board of Trade reference is ESB/11803/61.

From South Australia:

5 diesel-electric locomotives, 5-ft. 3-in. gauge, B.S.S. 2953/58

1 set bogie wheels, axles, journal bearings, traction motors and gearings.

The issuing authority is the Railways Commissioner, South Australian Government Railways, Box 1825, G.P.O., Adelaide, to whom bids should be sent. The contract No. is C.M.E. 2/61. The closing date is June 1, 1961. The Board of Trade reference is ESB/12011/61.

From Pakistan:

4,220 dozens of fog-signals in tin cases.

The issuing authority is the Chief Controller of Purchase, Pakistan Western Railway, Empress Road, Lahore, to whom bids should be sent. The tender No. is P-577/P5/6-60. The closing date is May 3, 1961. Local representation is considered desirable. The Board of Trade reference is ESB/11850/61.

9,200 32V. 250W. clear glass, gas-filled, electric lamps.

The issuing authority is the Chief Controller of Purchase, Pakistan Western Railways, Empress Road, Lahore, to whom bids should be sent. The tender No. is S-208/P2/2-61. The closing date is April 29, 1961. Local representation is considered desirable. The Board of Trade reference is ESB/11851/61. No further information is available at the Board of Trade.

Further details relating to the above tenders together with photo-copies of tender documents, unless otherwise stated, can be obtained from the Branch (Lacon House, Theobald's Road, W.C.1).

NOTES AND NEWS

Acknowledgment of photograph. In the article on rail-clips which appeared in our last issue we acknowledge the reproduction of a photograph by kind permission of the Chief Civil Engineer, British Railways, Southern Region. Unfortunately, the name appeared incorrectly. This should have read Mr. A. H. Cantrell.

"Derby A.B.C." to close. Next month's issue of the *Derby A.B.C. Railway Timetable* will be the last because of rising costs. The timetable was first published in 1849; the only time it has failed to appear was during the printing dispute in 1959.

"Queen of Scots" Pullman. New Pullman coaches have been put into service on this train, which runs on weekdays between Kings Cross and Queen Street, Glasgow. A description of the new stock will be given in a subsequent issue.

Visit of Mexican industrialists. At the invitation of the Western Hemisphere Exports Council and the Federation of British Industries a party of Mexican industrialists is on a visit to Britain. They are investigating the purchasing of machinery, and capital and producer equipment.

British Railways Amateur Boxing Finals, 1951. The 1961 finals of the British Railways Amateur Boxing Association championships are to be held at the Railway Institute, Queen Street, York, on April 21.

Cheap excursions to Amateur Cup Final. Special cheap excursion tickets to Wembley Park Station are to be issued from a number of London Transport and British Railways stations in the East London area, for the benefit of Walthamstow Avenue supporters, on April 22.

Food-vending machines on British Railways. A single-column 12-compartment food vendor, operated by the British Automatic Co. Ltd., was recently tried out on an experimental trip to Chelmsford in the Eastern Region of British Railways to find out whether the vibration of the train would affect the coin mechanism. The machine passed the most vigorous test with flying

colours. Plans are being discussed for the installation by the British Automatic Co. Ltd., of food vending machines in selected trains.

Railway Development Association. The Midland Area Railway Development Association is to hold its annual general meeting, on April 20, at the Exchange Restaurant, Stephenson Place, Birmingham, commencing at 7 p.m. The guest speaker will be Mr. J. Pollard, Assistant Divisional Traffic Manager, Birmingham, British Railways, London Midland Region.

Retirement luncheon. A luncheon has been arranged at the Dorchester Hotel for Mr. W. N. Roberts, District Passenger Manager, Euston, British Railways, London Midland Region, who is retiring.

East Anglian Ranger ticket. The Great Eastern Line of the Eastern Region of British Railways has announced that its East Anglian Ranger ticket is available this year until October 27. It offers six days' unlimited rail travel anywhere in East Anglia from all stations on the Great Eastern Line. It is not valid for Saturday travel. The cost of the ticket is £3 12s. 6d. second class and £5 7s. 6d. first class. Children under three years of age travel free and those from three to under 14 years of age at half fare. One and a half or more tickets for one family for the same six days will cost only £3 5s. second class for each adult and £1 12s. 6d. for each half fare. Bookings, which should be made three days in advance, can be accepted by the Season Ticket Office, British Railways, Liverpool Street Station, or by any station within the area which the ticket covers.

Works Managers' Conference. The 1961 International Conference of the Institution of Works Managers will be held at the Linden Hall Hotel, Bournemouth, from April 21 to April 23 inclusive. Speakers will include Mr. W. J. Carron, President, Amalgamated Engineering Union (who will explain what British trade unions expect from management); Mr. Folke Halden, of Sweden; Mr. R. B. Dunlop, of the U.S.A., Dr. C. Gasser, of Switzerland (who will describe Swiss achievements attained during 20 years without strikes), and Sir William Garrett.

Special trains to Newmarket. Special "all-in" tickets, covering express rail and road transport from London to the Newmarket Racecourse and admission to the Silver Ring, are being issued by the Eastern Region of British Railways for the 1961 flat racing season. The trains—"Punters Expresses," which have refreshment car facilities—will run on all race days during the season, from April 11 until October 28. Departures are from both Kings Cross and Liverpool Street Stations between 10.55 a.m. and 12.05 p.m. Fully "inclusive" return tickets cost only 31s. (first class) and 22s. 6d. (second class). Return rail and road fares only, which do not include admission to the Silver Ring, are 24s. (first class) and 15s. 6d. (second class).

Short works course for schoolboys. British Railways, Eastern Region, held a short works course at Doncaster during the Easter holiday vacation to enable boys from public and grammar schools throughout the country to be given an insight into the workings of the technical departments of British Railways. The course was held in the Chief Mechanical & Electrical Engineer's department of the Eastern Region at Doncaster on April 10 until April 14, 1961. The programme included tours of the Doncaster Locomotive and Carriage & Wagon Works, Lincoln Motive Power Depot, Signalling at Doncaster and a visit to the Drawing Office, and Photographic departments of the Chief Mechanical & Electrical Engineer at Doncaster. Lectures and discussions were included in the itinerary, the course ending with a tour of the Electric Traction Engineer's depot at Ilford, Essex.

Eastern Region cyclists' rail excursion. A cyclists' rail excursion from South Yorkshire and North Derbyshire to Ripon in Yorkshire, has been planned by the Eastern Region of British Railways for Sunday, May 7. The special train will [start from [Chesterfield (Midland) at 7 a.m., calling at Sheffield (Midland) at 7.38 a.m., Rotherham (Masborough), 7.53 a.m., Mexborough 8.12 a.m., and at Doncaster at 8.34 a.m., arriving Ripon at 11.16 a.m. A variety of conducted cycle tours of the North Yorkshire moors and dales will be run from Ripon under the leadership of the Cyclists' Touring Club. Specially equipped cycle vans will be provided on the train so that cycles may be conveyed with the maximum safety. These vans have been inspected and approved by local Cyclists Touring Club officials.

Sir Brian Robertson with Mr. J. R. Hammond, General Manager, Western Region (left); and Mr. F. G. Dean, District Traffic Superintendent right, at Plymouth

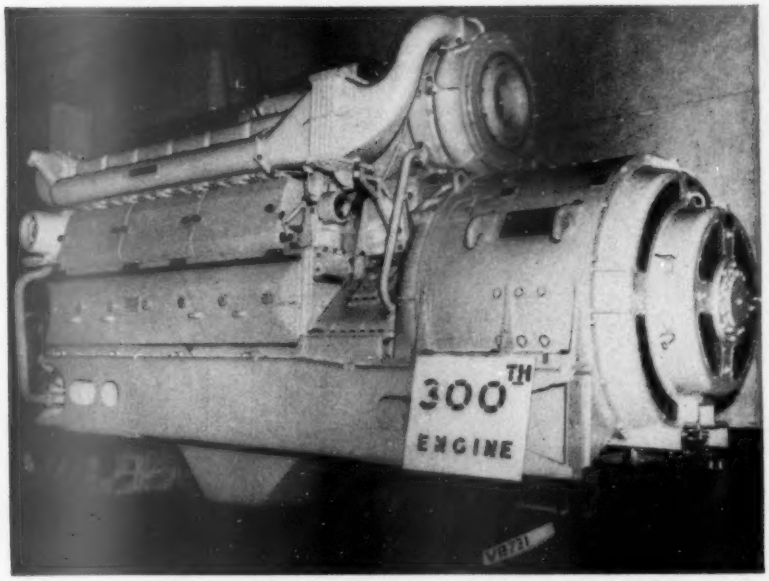
Suspended services on London Transport. The Sunday train service on the Uxbridge branch of London Transport Metropolitan and Piccadilly lines will be suspended between Ruislip and Ickenham until 6 p.m. on six Sundays—April 16, 23, 30 and May 7, 21, 28—while reconstruction work is carried out on the Western Region bridge over the Metropolitan line at West Ruislip. During the suspensions, special buses for rail passengers will run between Ruislip and Hillingdon, stopping at Glebe Avenue for Ickenham. A shuttle train service with trains running every 7-8 min. will operate between Ickenham, Hillingdon, and Uxbridge. Metropolitan trains from Baker Street will turn back at Ruislip; Piccadilly trains will reverse at Rayners Lane, Certain trains before 9 a.m. will continue to Ruislip.

Southern Region introduce new container. The Southern Region of British Railways has demonstrated a new type of container, called a "Tote Bin," to traders in Southampton, Poole and Guildford. It is a hermetically sealed box designed for transporting liquids, bulk powders, and grain, and eight of these boxes can be loaded into a wagon. The loadability of the boxes and their ultra-hygienic construction may help to cut the cost of transporting food.

Chairman's visit to West Country. Sir Brian Robertson, Chairman of the British Transport Commission, accompanied by Mr. K. W. C. Grand (Member of the Commission), Mr. R. F. Hanks (Chairman of the Western Region Area Board), Mr. J. R. Hammond, General Manager, and other officers of the Western Region of British Railways, visited the West Country on March 28-29. Inspections were made of the work in progress at Plymouth Station, including the new signalling installation, also the civil and signal engineering depots at Devonport and the new diesel depot and staff hostel at Laira. The party later visited Torquay and Paignton stations and the diesel depot at Newton Abbot. A photograph of the party will be found elsewhere on this page.

New grill and bar. A new grill and bar, "The West Riding," was opened by British Transport Hotels & Catering Services at Bradford (Forster Square) Station on April 19.

Devon General Omnibus meeting. At the 42nd annual general meeting of the Devon General Omnibus & Touring Co. Ltd., the Chairman, Mr. W. M. Dravers said that profits, in 1960, had been slightly affected by the flooding in the West Country, and explained how economies had been effected. He went on that wage increases, amounting to 10 per cent on the wages bill, had compelled increases in certain fares and if costs rise again there may be some further with-



The 300th Sulzer traction engine built at Barrow-in-Furness

drawal of facilities and a reduction in numbers of personnel employed.

Anniversary dinner. Mr. Arthur Henry Hawkins, former Operating Manager (Country Buses & Coaches), London Passenger Transport Board, was entertained to dinner, on April 6, at the Trocadero Restaurant by six Chief Officers and Officers who had served with him. The dinner was in celebration of Mr. Hawkins's 80th birthday and also the 50th anniversary of the foundation of the East Surrey Traction Company, on May 23, 1911. Mr. Hawkins was one of the founders of the Company and was Managing Director from its formation until (after the name had been changed to "London General Country Services Limited" in 1932) it was taken over by the London Passenger Transport Board in 1933. The dinner was organised at the suggestion of Mr. John B. Burnell, Operating Manager (Central Road Services), London Transport, and the other five hosts were: Mr. T. L. Davies, Chief Financial Officer, British Transport Docks Division; Mr. G. Fernyhough, Operating Manager (Country Buses & Coaches), London Transport Executive; Mr. G. J. Dickins, Traffic Development Officer, London Transport Executive; Mr. K. G. Shave, Rolling Stock Engineer (Road Services), London Transport Executive; and Mr. R. Postgate, Traffic Auditor, London Transport Executive. Mr. W. A. C. Snook, former Rolling Stock Engineer, London Passenger Transport Board (and at one time Mr. Hawkins's Chief Engineer with the East Surrey Traction Company), was also present.

300th Sulzer Engine for British Railways. Illustrated on this page is the 300th Sulzer 12-cylinder diesel engine of 2,500 h.p. built recently by Vickers-Armstrongs (Engineers) Limited at Barrow-in-Furness for a British Railways locomotive. This engine is the intercooled version of the 12LDA28 design being supplied to power Type 4 locomotives under construction at both Derby and Crewe Locomotive Works.

New Metropolitan Line cars undergo trials. The first four-car unit of the London Transport Executive's new A.60 stock for Metropolitan Line services to Amersham, Chesham and Watford has been undergoing extensive trials during the last few weeks between Baker Street and Amersham. It is the first of 62 four-car units intended to form 31 eight-car trains, now being built by Cravens Limited of Sheffield. A second batch of cars (known as the A.62 stock) to make 27 eight-car trains for the Metropolitan Line Uxbridge service is also on order from Cravens Limited. The four cars now on test have been sent to London in a partially finished state so that the necessary engineers' trials can be carried out without the necessity of removing items already fitted. A picture of the new unit appears elsewhere on this page.

Change of telephone number. The telephone number of Kabi (Electrical & Plastics) Limited has been changed to Potters Bar 53444. Callers from London will be required to dial PR followed by the five-figure number.

Members of Parliament at Central Transport Consultative Committee. The meeting of the Central Transport Consultative Committee on March 21 was attended by a deputation which included Mr. H. J. Boyden, M.P. (Bishop Auckland—Lab.) and Mr. A. Bourne-Arton, M.P. (Darlington—Con.) to make representations against the closure of a railway line. The committee heard the deputation which was protesting against the British Transport Commission's proposal.

London Transport Executive first four-car unit of the Metropolitan line A.60 stock on trials

to close the Barnard Castle—Penrith Line, for an hour and a half, and considered the proposal in private for as long again, before concluding that further detailed local investigation was required into journey times of consignments of limestone and coke, about which complaints had been made by the deputation. This is the first time that Members of Parliament have seen for themselves the Central Transport Consultative Committee at work.

Railway Stock Market

Stock markets again showed an upward trend with many industrial shares attracting fresh buying, despite moderate yields and the prospects that the scope for higher dividends will be less than it was a year ago. The hopeful views expressed in the Economic Survey continued to help sentiment which was unaffected by the general belief that the Budget can bring little in the way of tax reductions. The rise on Wall Street also helped markets over here.

Movements in foreign rails were again small. Antofagasta ordinary and preference stocks changed hands around 16¼ and 35 respectively, United of Havana second income stock was again 6¼, Mexican Central "A" bearer debentures was 61, and elsewhere, San Paula Railway 3s. units kept at 1s. 2¼d. Midi 4 per cent sterling bonds were 85½.

Costa Rica ordinary stock was 41½ following the chairman's annual statement; the first debentures 97½, and the second debentures quoted at 125. International of Central America common shares were $22½ with the preferred stock $119½.

Chilean Northern first debentures were 50, Brazil Railway bonds 4⅛, and Paraguay Central prior debentures kept at 17½.

Canadian Pacifics were up to $44, helped by the Wall Street trends; the preference stock was 59¾ and the 4 per cent debentures 58½. White Pass shares were $10½.

Elsewhere, however, Nyasaland Railways shares eased a few pence to 11s.; the 3½ per cent debentures were 33½. Midland of Western Australia ordinary stock was quoted at 8½ and the £1 units of second debentures were 6s. West of India Portuguese capital stock was 117½ and the 5 per cent debentures 96, while Barsi Light Railway stock was quoted at 17.

Among shares of locomotive builders and engineers, Birmingham Wagon came back to 28s. 4½d., North British Loco. were easier at 7s. 9d. Beyer Peacock 5s. shares moved up to 8s. 1½d. and Charles Roberts 5s. shares were better at 8s. 3d.

Westinghouse Brake have been steady at 41s., at which there is a yield of over 5¼ per cent on the basis of last year's 11 per cent dividend. Gloucester Wagon 10s. shares were 10s. 6d. and Wagon Repairs 5s. shares 19s., but in other directions G. D. Peters have been easier at 19s. 4½d.

In electricals, G.E.C. came back to 37s. 3d., English Electric lost a few pence at 37s. 3d., and A.E.I. were 44s. 6d. B.I.C.C. have been steady at 58s. 4½d., but Johnson & Phillips receded to 20s. 6d. On the other hand, machine tool shares attracted buyers, and Alfred Herbert rose to 74s. 3d. Coventry Gauge 10s. shares were 31s. 6d. Broom & Wade 5s. shares at 28s. 6d. were "ex rights" to the offer of new shares, and elsewhere, Pressed Steel 5s. shares eased to 31s. 9d., while Dowty Group 10s. shares were 40s. 6d. Buyers have been about for Vickers in the hope that the 10 per cent dividend may be maintained and the price moved up to 33s. 7½d. Pollard Bearing 4s. shares were 40s. 6d. and Ransome & Marles 5s. shares changed hands around 23s. 3d. and Rustin & Hornsby rose to 30s. 9d. British Oxygen 5s. shares touched the new high level of 35s. and Tube Investments were at a fresh peak of 85s. 3d.

Following news of the new rights issue, Stewarts & Lloyds shares rallied to 59s. 1½d., and steel shares generally attracted more attention, because they offer quite attractive yields and dividends are expected to be maintained. Dorman Long at 38s. 4½d. yield over 5 per cent, United Steel at 67s. 6d. over 4½ per cent, and Colvilles at 80s. 1½d., fully 4 per cent.

Forthcoming Meetings

April 14 (*Fri.*). The Institute of Transport, Northern Section, at the Royal Station Hotel, Newcastle, at 7 p.m. Annual general meeting.

April 14 (*Fri.*). The Institute of Transport, Swindon Group, at the Engineering Society's Rooms, Emlyn Square, at 7.15 p.m. Annual general meeting.

April 15 (*Sat.*). The Stephenson Locomotive Society, North Stafford & Cromford & High Peak rail tour.

April 15 (*Sat.*). Talyllyn Railway Preservation Society, North-West Area. Annual reunion at the Memorial Hall, Albert Square, Manchester, at 2 p.m.

April 15 (*Sat.*). The Historical Model Railway Society, at 2 p.m. Visit to B.T.C. museum at Clapham.

April 15 (*Sat.*). The Railway & Canal Historical Society, North-eastern and North-western groups joint visit to Standedge tunnel.

April 17 (*Mon.*). The Institution of Mechanical Engineers, Hydraulic Plant & Machinery Group, at 1 Birdcage Walk, London, S.W.1, at 6 p.m. Discussion on "Coordinating the needs of hydraulic machinery and civil engineering."

April 18 (*Tue.*). The Institution of Locomotive Engineers, at the Institution of Mechanical Engineers, 1 Birdcage Walk, S.W.1, at 5.30 p.m. Annual general meeting, followed by an ordinary general meeting, at which a paper will be presented entitled "Work study and its application to motive power activities," Mr. G. O. B. Clarke, and Mr. W. G. F. Thorley.

April 18 (*Tue.*). The Institution of Mechanical Engineers, at the Chemistry Lecture Theatre, University of Leeds, at 6.30 p.m. "The influence of rate of strain-hardening in machining," Mr. A. G. Humphries, and Mr. A. Larizadeh, and "Some physical aspects of built-up nose formation," Mr. W. G. Heginbotham, and Mr. S. L. Gogia.

April 19 (*Wed.*). The Institution of Mechanical Engineers, Education & Training Group, at 1 Birdcage Walk, London, S.W.1, at 6 p.m. Discussion on "Undergraduate project work in full-time and sandwich courses in mechanical engineering.

April 22 (*Sat.*). The Stephenson Locomotive Society, High Peak rail tour.

April 24 (*Mon.*). The Institution of Railway Signal Engineers, Bristol Section, at Bristol Temple Meads Station, at 6 p.m. Annual general meeting.

April 25 (*Tue.*). The Institute of Transport, at the Connaught Rooms, Great Queen Street, W.C.2, at 12.15 p.m. Informal luncheon.

April 26 (*Wed.*). The Institution of Electrical Engineers, Electronics & Communication Section, at Savoy Place, London, W.C.2, at 5.30 p.m. "Data transmission," Mr. R. H. Franklin, and Mr. J. Rhodes.

April 26 (*Wed.*). The Institution of Mechanical Engineers, at 1 Birdcage Walk, London, S.W.1, at 6 p.m. Annual meeting.

April 26 (*Wed.*). The Institution of Mechanical Engineers, at 1 Birdcage Walk, London, S.W.1, at 6 p.m. Annual report of the council.

April 27 (*Thu.*). The Institution of Mechanical Engineers, Steam Plant Group, at 1 Birdcage Walk, London, S.W1, at 6 p.m. Discussion on "Acid cleaning as applied to steam power plant."

April 27 (*Thu.*). The Permanent Way Institution, Nottingham & Derby Section, at the Victoria Station Hotel, Nottingham, at 6.30 p.m. "Some track maintenance problems," Mr. F. Fawcett.

April 27 (*Thu.*). The Model Railway Club, at Keen House, Calshot Street, Kings Cross, N.1, at 7.45 p.m. "Scotland 1959-60," Mr. J. J. Davis.

April 28 (*Fri.*). The Railway & Canal Historical Society, West Midlands Group, at the Engineering Centre, Stephenson Place, Birmingham 2, at 7.15 p.m. Film show.

April 29 (*Sat.*). Railway Correspondence & Travel Society, East Midlands Branch, Vale of Belvoir tour. Special train leaves Nottingham Midland at 1.40 p.m.

May 3-4 (*Wed.-Thu.*). Railway Modernisation Conference. Joint conference with the Institution of Electrical Engineers, the Institution of Civil Engineers, and the Institution of Mechanical Engineers, at the Institution of Civil Engineers at Great George Street, London, S.W.1.

OFFICIAL NOTICES

APPLICATIONS are invited from Engineering Draughtsmen to fill positions in a Company engaged in the manufacture of steel castings, forgings, engineering equipment and railway trackwork.

Applicants should have had drawing office and design experience in any of the above spheres, and should also possess technical qualifications of at least the Ordinary National Certificate in Mechanical Engineering.

Five day week, pension scheme, staff dining and welfare facilities available.

Replies, stating age, experience and salary required, should be addressed to the Personnel Manager, Hadfields Ltd., East Hecla Works, Vulcan Road, Sheffield 9.

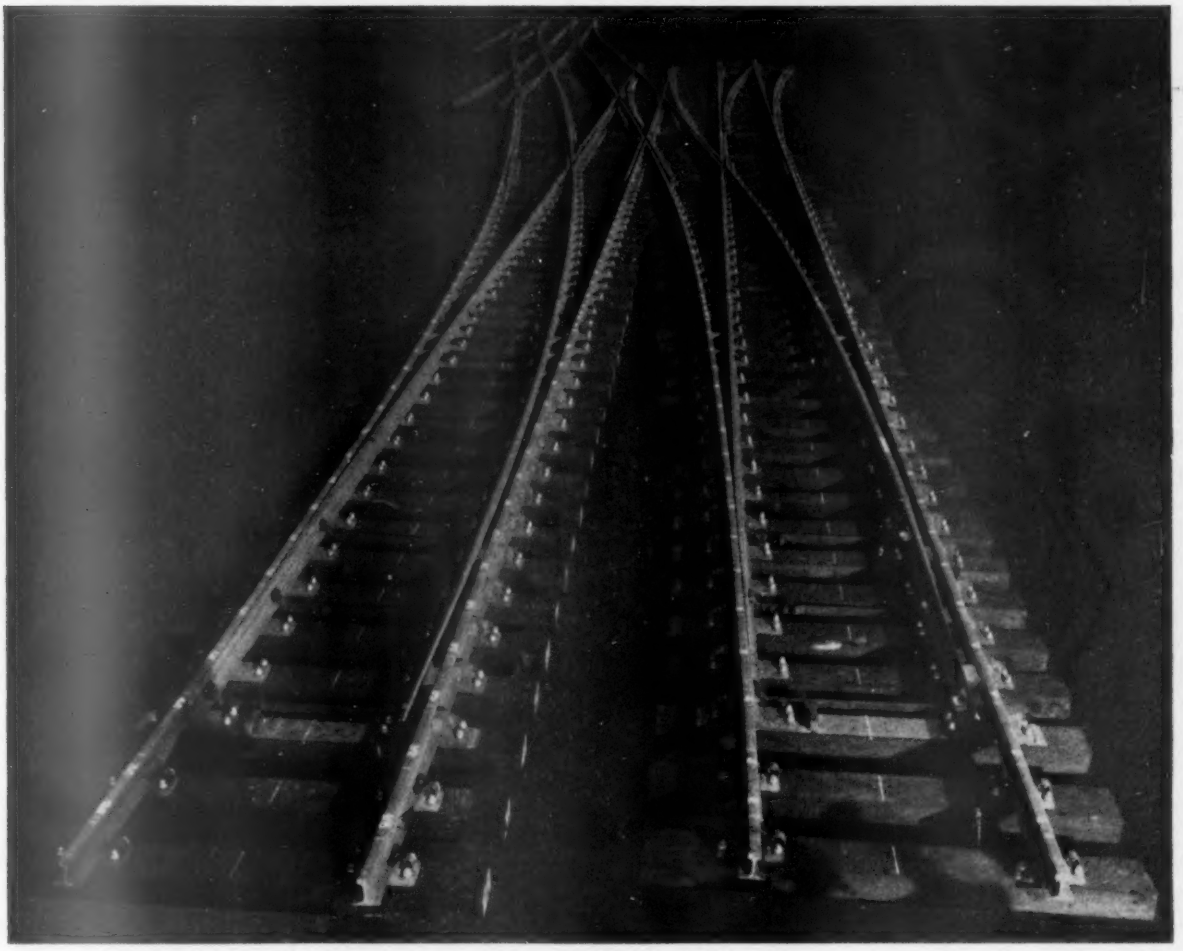
ROADMASTER

ENGINEERING GRADUATE preferred; minimum of two years' engineering training essential. Require two years' varied railroad engineering service, or five years in direct charge of track crews. Will supervise 135 men maintaining 45-mile railroad, assign work, order materials, be responsible for safety, make regular detailed inspections of roadbed and all track on main line, sidings and yards, bridges, tunnels, etc. Will make engineering calculations relating to maintenance and use of structure and equipment. Must speak Spanish. Married or single candidates acceptable.

Excellent opportunity large copper company, Chile, South America. Two year contract with transportation both ways for you and family. Basic salary $525.00 to $650.00 per month depending upon age and experience of applicant.

Box 6, *The Railway Gazette*, 33 Tothill Street, S.W.1

SWITCHES and CROSSINGS



Photograph by courtesy of the Chief Civil Engineer, Eastern Region.

JUNCTION AT ROMFORD ON THE LIVERPOOL STREET – NORWICH MAIN LINE, EASTERN REGION, BRITISH RAILWAYS.

This junction, comprising Main to Electric crossover lines, has been manufactured by us from the new B.S. 110A. F.B. rail incorporating the latest design of switches with "foot-planed" stock rails, also the improved type of Mills C.3. clip fastenings and plastic ferrules.
The photograph shows the material built up and timbered at our works for inspection, to the exact requirements of the Chief Civil Engineer.

We specialise in the manufacture of switches and crossings; single, double and outside slips; tandem, threethrow and simple turnouts; scissors crossovers and layouts of any description.

TAYLOR BROS. (SANDIACRE) LTD.
MIDLAND FOUNDRY, SANDIACRE, NR. NOTTINGHAM
Telephone: SANDIACRE 3141 (5 lines) **ESTABLISHED 1858** *Telegrams: TAYLOR BROS. SANDIACRE*

LONDON OFFICE:
59 GORDON SQUARE, W.C.1 *Telephone: MUSEUM 2821* *Telegrams: TORRIDITY LONDON*

Drum Lifting Device type FLR 10 which releases the load by overlowering of crane.

Low headroom Multi-Polar Electro-magnetic Lifting Beams. 6 to 10 ft. up to 5 tons S.W.L.

B.E.R.L Lifting tackle for every type of load

Right: Triple suspension, screw toggle operated, cylindrical load lifting device.

Left: Crane driver operated lifting device for open top cases with ¾" to 2" thick side walls.

Rubber covered, woven wire flat band flexible slings.

British Electrical Repairs Ltd

Head Office:

Empire House, 10 Charlotte Street, Manchester 1

MANCHESTER: 77 Holland St., Newton, 10. GLASGOW: Adelphi Engineering Works, 135-143 Reid St., Bridgeton, S.E.

or contact us at Bath, Birmingham, Cardiff, Chesterfield, Edinburgh, Hawick, London, Newcastle-upon-Tyne; Swansea.

dm BER 120

THE RAILWAY GAZETTE

A journal of Railway Management, Engineering, Operation, and Railway News. It covers every phase of railway activity. It is truly said of this journal that it is "Read wherever there are Railways." *Weekly* 2s. *Annually* £5 *by post.*

DIESEL RAILWAY TRACTION

A monthly review of world-wide developments in diesel-engine design, practice, and maintenance and diesel railway traction operation. *Monthly* 2s. 6d. *Annually* 35s. *by post.*

SHIPBUILDING AND SHIPPING RECORD

The only publication with direct appeal to both shipowner and shipbuilder. Its world-wide news organisation and technical articles and drawings put it in the forefront of shipping periodicals. *Weekly* 2s. *Annually* £5 *by post.*

COLLIERY ENGINEERING

A practical journal dealing with all aspects of coal production; every branch of coal mining technology is reviewed in detail and special attention is given to mechanisation and labour-saving machinery. *Monthly* 2s. 6d. *Annually* £2 *by post.*

COKE AND GAS

A technical journal dealing with the scientific and technical problems involved in the production of coke and gas in coke ovens and gasworks. *Monthly* 2s. 6d. *Annually* 35s. *by post.*

THE RAILWAY MAGAZINE

A popular magazine containing illustrated articles on Railways and Locomotives. *Monthly* 2s. 6d. *Annually* 35s. *by post.*

NEW COMMONWEALTH

Describes and illustrates significant developments in production, trade, transportation and related spheres in all countries of the Commonwealth. *Monthly* 2s. 6d. *Annually* £2 *by post.*

THE INDUSTRIAL CHEMIST

A technical journal devoted to the progress of applied chemistry and chemical engineering. It is of vital importance to the chemical manufacturer and all who employ chemical processes in their productive operations. *Monthly* 2s. 6d. *Annually* £2 *by post.*

WOOD

"Wood" is the only magazine of its kind. Primarily concerned with the use of wood, it includes articles on trees and timbers, design and construction in all decorative and practical wood usage, machines and machine practice, and trends in world supply. *Monthly* 2s. 6d. *Annually* 35s. *by post.*

FOOD PROCESSING AND PACKAGING

A journal devoted to the manufacture, packaging, and marketing of processed foodstuffs. *Monthly* 2s. 6d. *Annually* £2 *by post.*

WATER POWER

A technical journal devoted to the study of all aspects of Hydro-Electric Development. *Monthly* 2s. 6d. *Annually* £2 *by post.*

MINE AND QUARRY ENGINEERING

Articles of technical nature cover geology, modern methods of prospecting, the winning of ore and stone, the dressing of ore and minerals, and extraction metallurgy. *Monthly* 2s. 6d. *Annually* 35s. *by post.*

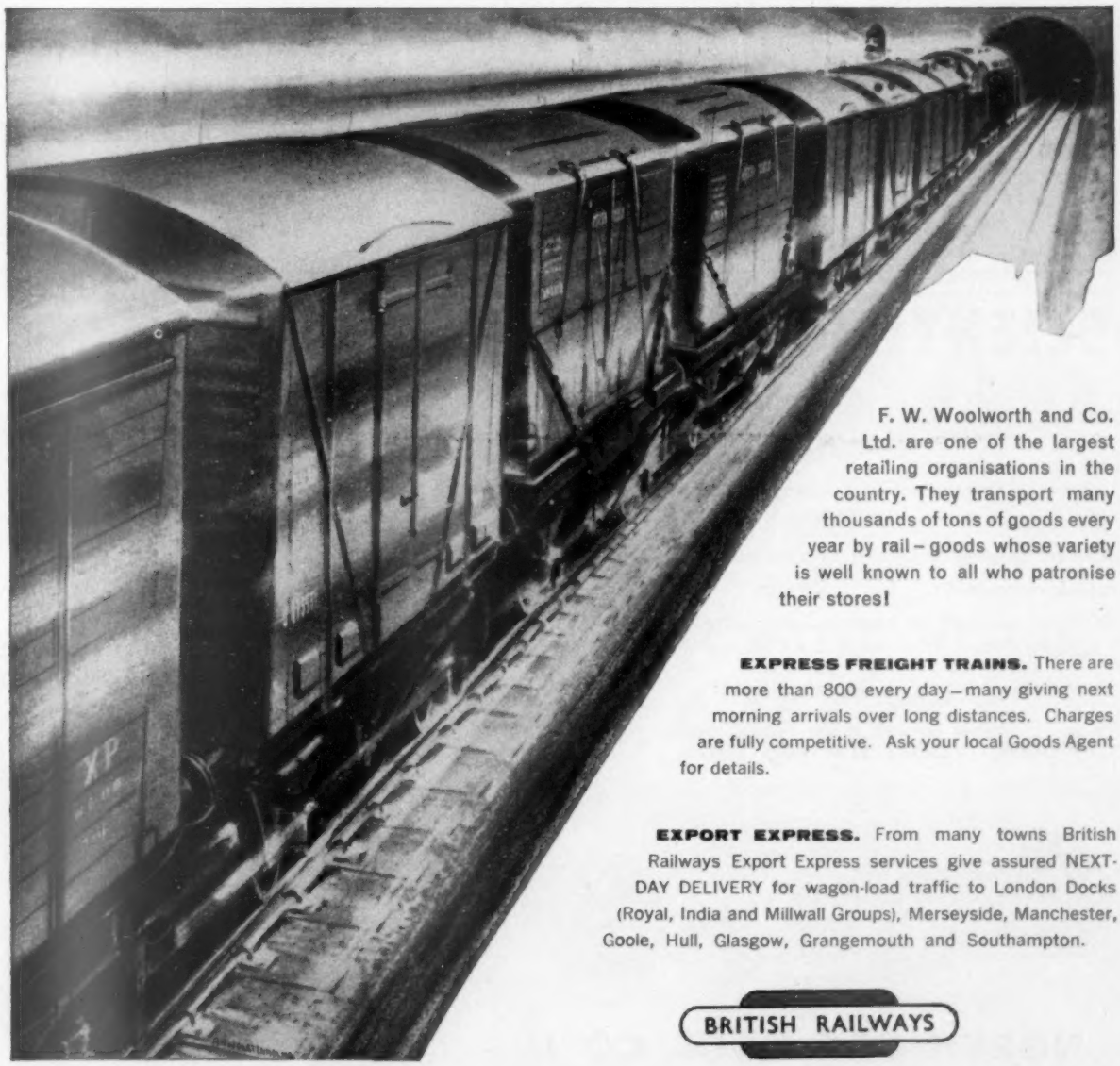
TOTHILL PRESS LIMITED

33, Tothill Street, Westminster, London, S.W.1

WOOLWORTHS USE

BRITISH RAILWAYS

MODERN FREIGHT SERVICES



F. W. Woolworth and Co. Ltd. are one of the largest retailing organisations in the country. They transport many thousands of tons of goods every year by rail – goods whose variety is well known to all who patronise their stores!

EXPRESS FREIGHT TRAINS. There are more than 800 every day – many giving next morning arrivals over long distances. Charges are fully competitive. Ask your local Goods Agent for details.

EXPORT EXPRESS. From many towns British Railways Export Express services give assured NEXT-DAY DELIVERY for wagon-load traffic to London Docks (Royal, India and Millwall Groups), Merseyside, Manchester, Goole, Hull, Glasgow, Grangemouth and Southampton.

BRITISH RAILWAYS

ELECTRIFICATION on the FRENCH RAILWAYS

★

120 MORE MILES ELECTRIFIED IN 1961

PB 79A

SCIENTIFIC BOLT TIGHTENING
by the Torshear Method

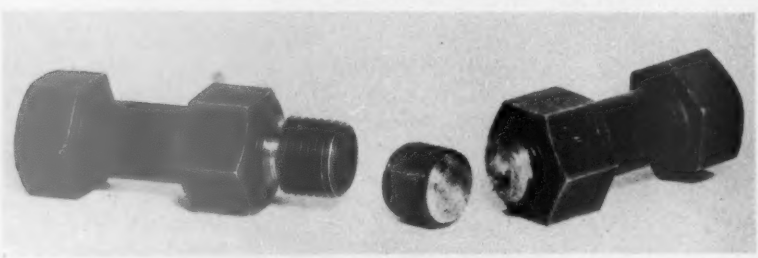
All the advantages of high strength bolts without the worries.

Correct loading is certain and automatic with no operator control.

100% inspection for correct bolt tightening at a glance.

If the bolt extension is sheared, it's tight.

Power Tools for big jobs • Hand Torshear Tools for little jobs



TORSHEAR BOLTS

Manufactured and supplied by

A. P. NEWALL & CO. LTD.

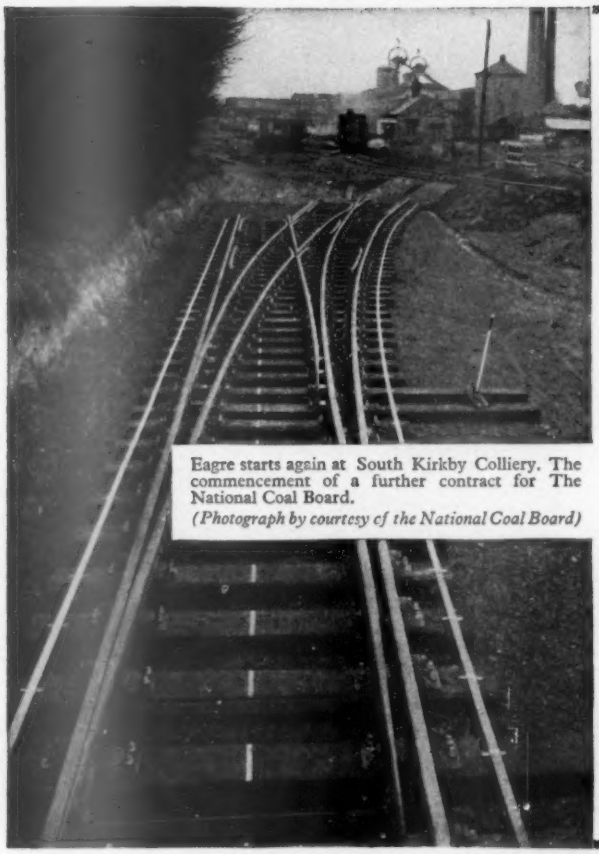
POSSILPARK · GLASGOW · N.2

GUEST KEEN & NETTLEFOLDS

NUT & BOLT DIVISION · DARLESTON · STAFFS

NORTH BAR TOOL CO LTD BANBURY · OXON · ENGLAND

TELEPHONE: BANBURY 4234/5



Eagre starts again at South Kirkby Colliery. The commencement of a further contract for The National Coal Board.
(Photograph by courtesy of the National Coal Board)

for a complete track service

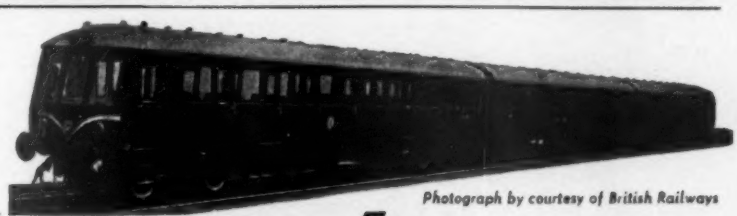
SURVEY **DESIGN**

SUPPLY **INSTALLATION**

EAGRE

Eagre's skilful planning and practical experience on railway preparation, from earthworks to the finished job, ensures that your scheme can be well and economically laid. Railway material is supplied from Eagre's own resources. Eagre also works for British Railways, the Gas Board, the United Steel Companies, Central Electricity Authority etc. Whatever the magnitude of your siding requirements, consult—

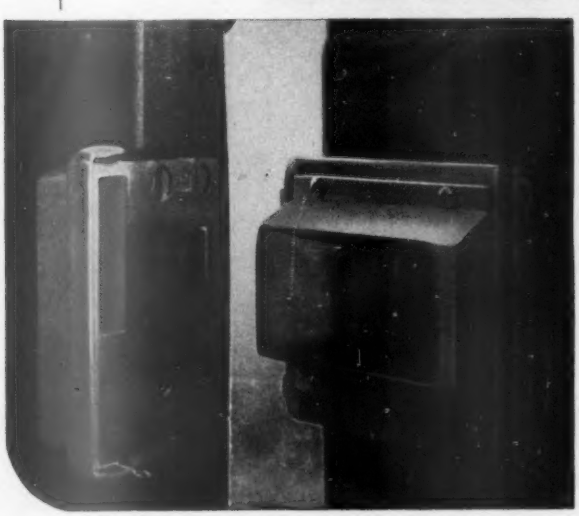
EAGRE CONSTRUCTION CO. LTD.
East Common Lane, SCUNTHORPE, Lincs.
Telephone 4513 (5 lines) E



Photograph by courtesy of British Railways

KAYE'S

AUTOMATIC WEDGE LOCKS

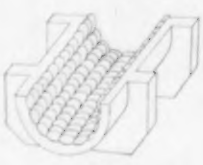


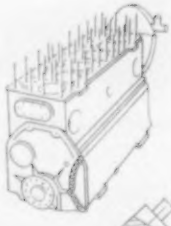
have been in use on British Railways for more than 60 years; and are now being fitted to doors of Diesel Inter-City and Suburban Rail-Cars.

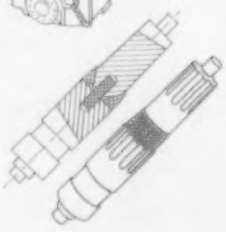
JOSEPH KAYE & SONS LTD.
LOCKWORKS
HUNSLET · LEEDS 10
London Office: 1-5 New Bond Street, W.1

REPAIR WELD—SAVE MORE WITH EUTECTIC

ON RAILWAYS







HERE'S HOW!

The range of over 150 different "Eutectic Low Temperature Welding Alloys" and associated products have been specially formulated for repair and maintenance applications. Based on the unique "Low Heat Input" concept these alloys give high-strength joints and overlays and minimise cracking, embrittlement and distortion. Often repairs can be done with a minimum of dismantling and long delays for replacement parts avoided.

HERE'S WHY!

Cast iron, steel, spring and other alloy steels, stainless steel, nickel, copper, brass, bronze, aluminium and magnesium alloys and zinc die castings can be repaired, or overlayed to minimise wear with Eutectic Alloys.

SEE FOR YOURSELF!

Send in the coupon today. Our local technical representative will be pleased to give free advice on your particular problems and to give you a free copy of Eutectic's pocket-size 68 page "Maintenance Welding Data Book".

SEE US ON STAND Y1 at the Welding Exhibition, Olympia.

ORIGINAL Low Temperature EUTECTIC WELDING ALLOYS

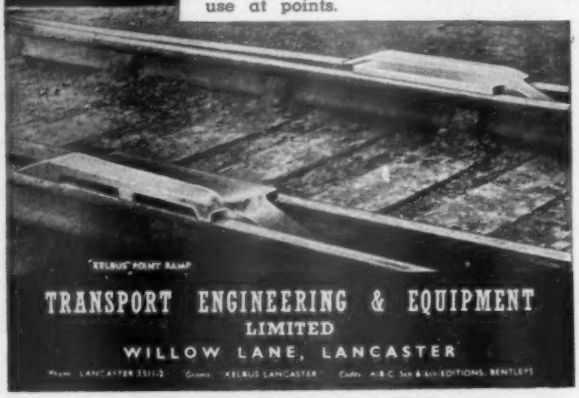
EUTECTIC WELDING ALLOYS CO. LTD.
North Feltham Trading Estate, Feltham, Middlesex. 'Phone: FEL. 6571

PLEASE SEND ME
☐ Free 68 Page Data Book
☐ Weld Savings Report

NAME .....
BUSINESS ADDRESS .....
.....
RG.25

KELBUS RAMPS

UNIQUE FEATURES:
NON-TILTING 'GUIDING TONGUE' SELF-ADJUSTING PORTABLE
A complete set comprises three pairs, which handle all forms of derailment. Two pairs (one pair to be on left of rail and the other on the right) are for open track, and one special pair for use at points.



TRANSPORT ENGINEERING & EQUIPMENT LIMITED
WILLOW LANE, LANCASTER

GROVERLOK

ensures *permanent* tightness

That nut must *stay* tight. That pin securely locked. Either way, the job calls for GROVERLOK.
GROVERLOK spring lock-washers, in girder, flat or square section ensure that any nut will remain tightly fixed.

GROVERLOK spring tension pins fit accurately, tightly, without special drilling or reamering. Both can easily be used by unskilled labour, both are thoroughly reliable.

GROVER & CO. LTD.

BRITANNIA ENGINEERING WORKS
CARPENTERS RD., LONDON, E.15
TELEPHONE: MARYLAND 4342-3

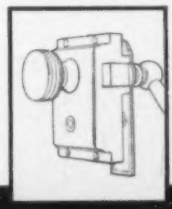
The Beresford

PEDAL-OPERATED W.C. WITH STAINLESS STEEL HOPPER

If you have experienced the high cost of constantly replacing less robust fittings, the advantages of this unit will immediately be apparent. It is *very* robust and the choice of materials ensures the longest possible life. It is an aid to improved conditions of hygiene and easily cleaned and maintained. The pan, rim and clack are of stainless steel, the base of vitreous enamelled cast iron and the valve of gunmetal. The pedal is also gunmetal and may be worded in any language. May we send you further details?

Also available with all-vitreous enamel finish.

We also make a wide range of coach fittings including luggage racks, locks, window fittings, vents, folding wash basins, toilet fittings, etc., and would be glad of the opportunity to provide you with complete information.



117

JAMES BERESFORD & SON LIMITED
(The Cornercroft Group of Companies)
Ace Works, Kitts Green, Birmingham, 33
Telephone: Stechford 3081
Branches at London, Leeds, Manchester, Glasgow, etc.

BERESFORDS – *makers of*
RAILWAY COACH FITTINGS

CONTRACTORS TO BRITISH RAILWAYS BRITISH TRANSPORT COMMISSION

Bletchley Flyover is designed to carry the Oxford/Cambridge line over the London Midland Region main line between Euston and the North-West. There are radical plans afoot for both routes: The overhead line is part of the London freight by-pass scheme and the electrification of the main line particularly will lead to even faster and more frequent trains than the line now carries.

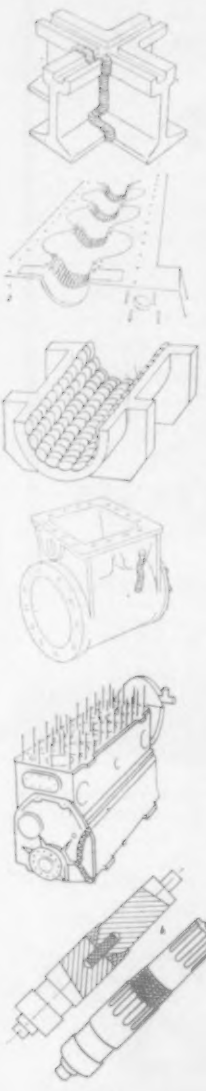
LEONARD FAIRCLOUGH LTD.

Civil Engineering and Building Contractors

HEAD OFFICE . . **CHAPEL STREET, ADLINGTON, LANCS.** *Adlington 264/5/6*
BRANCH OFFICES **573 CHESTER ROAD, OLD TRAFFORD, MANCHESTER 16.** *Trafford Park 1060*
GORDON HOUSE ROAD, LONDON, N.W.5. *Gulliver 8633/4*

REPAIR WELD—SAVE MORE WITH EUTECTIC

ON RAILWAYS



HERE'S HOW!

The range of over 150 different "Eutectic Low Temperature Welding Alloys" and associated products have been specially formulated for repair and maintenance applications. Based on the unique "Low Heat Input" concept these alloys give high-strength joints and overlays and minimise cracking, embrittlement and distortion. Often repairs can be done with a minimum of dismantling and long delays for replacement parts avoided.

HERE'S WHY!

Cast iron, steel, spring and other alloy steels, stainless steel, nickel, copper, brass, bronze, aluminium and magnesium alloys and zinc die castings can be repaired, or overlayed to minimise wear with Eutectic Alloys.

SEE FOR YOURSELF!

Send in the coupon today. Our local technical representative will be pleased to give free advice on your particular problems and to give you a free copy of Eutectic's pocket-size 68 page "Maintenance Welding Data Book".

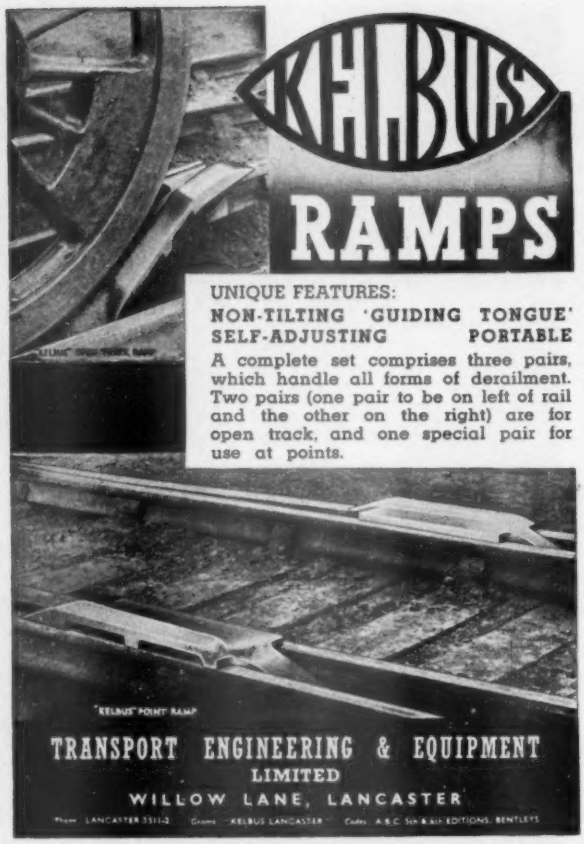
SEE US ON STAND Y1 at the Welding Exhibition, Olympia.

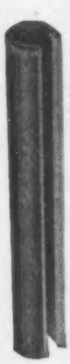
ORIGINAL *Low Temperature* EUTECTIC WELDING ALLOYS

EUTECTIC WELDING ALLOYS CO. LTD.
North Feltham Trading Estate, Feltham, Middlesex. 'Phone: FEL. 6571

PLEASE SEND ME
- ☐ Free 68 Page Data Book
- ☐ Weld Savings Report

NAME .....
BUSINESS ADDRESS .....
.....
RG.26


KELBUS
RAMPS
UNIQUE FEATURES:
NON-TILTING 'GUIDING TONGUE'
SELF-ADJUSTING PORTABLE
A complete set comprises three pairs, which handle all forms of derailment. Two pairs (one pair to be on left of rail and the other on the right) are for open track, and one special pair for use at points.
"KELBUS" POINT RAMP
TRANSPORT ENGINEERING & EQUIPMENT
LIMITED
WILLOW LANE, LANCASTER



GROVERLOK

ensures

permanent

tightness

That nut must *stay* tight. That pin securely locked. Either way, the job calls for GROVERLOK.

GROVERLOK spring lock-washers, in girder, flat or square section ensure that any nut will remain tightly fixed.

GROVERLOK spring tension pins fit accurately, tightly, without special drilling or reamering.

Both can easily be used by unskilled labour, both are thoroughly reliable.

GROVER & CO. LTD.

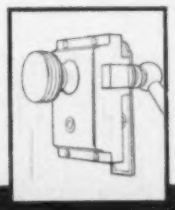
BRITANNIA ENGINEERING WORKS
CARPENTERS RD., LONDON, E.15
TELEPHONE: MARYLAND 4342-3

The
Beresford
PEDAL-OPERATED W.C. WITH STAINLESS STEEL HOPPER

If you have experienced the high cost of constantly replacing less robust fittings, the advantages of this unit will immediately be apparent. It is *very* robust and the choice of materials ensures the longest possible life. It is an aid to improved conditions of hygiene and easily cleaned and maintained. The pan, rim and clack are of stainless steel, the base of vitreous enamelled cast iron and the valve of gunmetal. The pedal is also gunmetal and may be worded in any language. May we send you further details?

Also available with all-vitreous enamel finish.

We also make a wide range of coach fittings including luggage racks, locks, window fittings, vents, folding wash basins, toilet fittings, etc., and would be glad of the opportunity to provide you with complete information.



J17

JAMES BERESFORD & SON LIMITED
(The Cornercroft Group of Companies)
Ace Works, Kitts Green, Birmingham, 33
Telephone: Stechford 3081
Branches at London, Leeds, Manchester, Glasgow, etc.

BERESFORDS - *makers of* **RAILWAY COACH FITTINGS**

CONTRACTORS TO BRITISH RAILWAYS BRITISH TRANSPORT COMMISSION

Bletchley Flyover is designed to carry the Oxford/Cambridge line over the London Midland Region main line between Euston and the North-West. There are radical plans afoot for both routes: The overhead line is part of the London freight by-pass scheme and the electrification of the main line particularly will lead to even faster and more frequent trains than the line now carries.

LEONARD FAIRCLOUGH LTD.
Civil Engineering and Building Contractors

HEAD OFFICE . . **CHAPEL STREET, ADLINGTON, LANCS.** *Adlington 264/5/6*
BRANCH OFFICES **573 CHESTER ROAD, OLD TRAFFORD, MANCHESTER 16.** *Trafford Park 1060*
GORDON HOUSE ROAD, LONDON, N.W.5. *Gulliver 8633/4*

INDEX TO ADVERTISEMENTS

Abingdon King Dick, Ltd. —
Abtus, Ltd. ... ... —
Aircraft Marine Products (Gt. Britain), Ltd. ... 29
Alfloc Water Treatment Service ... ... —
Alldays & Onions, Ltd. —
Allen, Edgar, & Co. Ltd. —
Allgemeine Elektricitats Gesellschaft ... ... —
Andre Rubber Co., Ltd. ... —
Armstrong Patents Co., Ltd. —
Asquith, Wm., Ltd. ... —
Associated British Machine Tool Makers, Ltd. ... 38
Associated Electrical Industries-GRS., Ltd. ... —
Associated Electrical Industries (Manchester), Ltd. 54
Associated Electrical Industries (Rugby), Ltd. ... —
Associated Electrical Industries (Woolwich), Ltd. ... —
Associated Lead Manufacturers, Ltd. ... ... —
Atlas-Copco A/B ... ... —
Auster, Ltd. ... ... —
Austin Taylor Electrical, Ltd. ... ... —
Automotive Products Co., Ltd. ... ... —

Bagnall, W. G., Ltd. ... —
Baker, John, & Bessemer, Ltd. 28
Bayliss, Jones & Bayliss, Ltd. 37
Beckett, Laycock & Watkinson, Ltd. ... ... —
Belships Co., Ltd., Skibs A/S —
Benjamin Electric Co., Ltd. —
B.E.N. Patents, Ltd. ... —
Beresford, James & Son Ltd. 51
Berry, Henry, & Co., Ltd. —
Beyer, Peacock, Ltd. ... —
Beyer, Peacock Gorton, Ltd. ... ... —
Beyer, Peacock (Hymek), Ltd. ... ... —
Beyer, Peacock, Railway Equipment, Ltd. ... —
Bintex, Ltd. ... ... —
Birfield Industries, Ltd. 10
Birkett, T. M., Billington & Newton, Ltd. ... ... —
Birmingham Railway Carriage & Wagon Co., Ltd. —
Bolton Gate Co., Ltd. —
Bolton, Thos., & Sons, Ltd. —
Booth, James, Aluminium, Ltd. ... ... —
Bowmaker (Plant), Ltd. ... —
Boydell, E., & Co., Ltd. ... —
Bristol Siddeley Engines, Ltd. —
Britannia Batteries, Ltd. ... —
British Electrical Repairs, Ltd. 46
British Ermeto Corp., Ltd. —
British Furniture Exhibition —
British Insulated Callender's Cables, Ltd. ... ... —
British Insulated Callender's Construction Co., Ltd. ... —
British Oxygen Co., Ltd. ... 24
British Oxygen Gases, Ltd. —
British Paints, Ltd. ... —
British Railways 47
British Timken, Division of The Timken Roller Bearing Company ... 53
British United Traction, Ltd. —
Bromsregulator Svenska Akt. 20
Brown Bayley Steels, Ltd. ... —
Brown, David (Industries), Ltd. ... ... —
Brush Traction, Ltd. ... —
B.T.R. Industries, Ltd. ... —
Bull, John, Rubber Co., Ltd. 4
Bullers, Ltd. ... ... —
Butler Machine Tool Co., Ltd. ... ... —

Caterpillar Tractor Co., Ltd. ... ... —
C.A.V., Ltd. ... ... —
Chapman, A. W., Ltd. ... —
Chipman Chemical Co., Ltd. —
Churchill Machine Tool Co., Ltd. ... ... —
Clayton-Wright, Howard, Ltd. ... ... —
Cleveland Bridge & Engineering Co., Ltd. ... ... —
Cleveland Meters, Ltd. ... —

Clyde Rubber Works Co., Ltd. ... ... —
Cobra (Wood Treatment), —
Cockerill, S. A., Ougree ... —
Ltd. ... ... —
Colvilles, Ltd. ... ... —
Commonwealth Sales Corporation 33
Consolidated Pneumatic Tool Co., Ltd. ... ... —
Conveyancer Fork Trucks, Ltd. 43
Cooper, Geo., & Sons ... —
Coventry Machine Tool Works, Ltd. ... ... —
Cowans, Sheldon & Co., Ltd. —
Craven Bros. (Manchester), Ltd. ... ... —
Cravens, Ltd. ... ... —
Crompton Parkinson, Ltd. —

Davey, Paxman & Co., Ltd. —
Davies & Metcalfe, Ltd. ... 12
Dean, Smith & Grace, Ltd. 16
Docker Brothers ... ... —
Dorman Long (Africa), Ltd. —
Dragonair, Ltd. ... ... —
Drewry Car Co., Ltd. ... —
Drummond Asquith, Ltd. —
Du Pont (United Kingdom) Ltd. ... ... —

Eagre Construction Co., Ltd. 49
Elastic Rail Spike Co., Ltd. —
Enfield - Standard Power Cables, Ltd. ... ... —
English Electric Co., Ltd. ... 1
English Steel Corporation, Ltd. ... ... —
E.N.V. Engineering Co., Ltd. —
Ericssons Signalaktiebolag, L.M. ... ... —
Eutectic Welding Alloys Co., Ltd. 50
Expanded Rubber Co., Ltd. —
Eyre Smelting Co., Ltd. ... —

Fairclough, Leonard, Ltd.... 51
Falk, Stadelmann & Co., Ltd. —
Fawcett Preston & Co. Ltd. —
Ferguson Battery Co., Ltd. —
Ferodo, Ltd. ... ... —
Fibreglass, Ltd. ... ... —
Finlay Engineering, Ltd. ... —
Flextol Engineering Co., Ltd. ... ... —
Fowler, John, & Co. (Leeds), Ltd. 21
French Railways 48

Ganz-Mavag ... ... —
General Electric Co., International 2
General Electric Co., Ltd. —
General Motors Overseas Operations ... ... —
General Steel Castings Corporation 33
Glacier Metal Co., Ltd. ... —
Gloucester Railway Carriage & Wagon Co., Ltd. 22
Godwin Warren (Engineering), Ltd. ... ... —
Greenwood's & Airvac Ventilating Co., Ltd. ... —
Gresham & Craven, Ltd. ... 6
Griffiths Bros. & Co. (London), Ltd. ... ... —
Grover & Co., Ltd.... ... 50

Hackbridge & Hewittic Electric Co., Ltd. ... —
Hackbridge Cable Co., Ltd. —
Hadfields, Ltd. ... ... —
Hallam, Sleigh & Cheston, Ltd. ... ... —
Hardy Spicer, Ltd.... ... —
Harper, John, & Co., Ltd.... —
Harvey, G. A., & Co. (London), Ltd. ... ... —

Hasler Telegraph Works, Ltd. ... ... —
Henderson & Keay, Ltd. ... —
Henschel Werke, G.m.b.H. —
Hitachi, Ltd. ... ... —
Hoffmann Manufacturing Co., Ltd. ... ... —
Holman Bros., & Co., Ltd. —
Howard Pneumatic Engineering Co., Ltd. ... ... —
Hudswell Clarke & Co., Ltd. —
Hunslet Engine Co., Ltd.... —
Hurtley, Fred., & Son, Ltd. —
Hyde, Robert, & Son, Ltd. —

Illingworth, E., & Co., Ltd. 43
Imperial Aluminium Co., Ltd. ... ... —
Imperial Chemical Industries, Ltd. ... ... —
Interchangeable Tool Co.... —
Intermit, Ltd. ... ... —
International Twist Drill Co., Ltd. ... ... —
Isca Foundry, Ltd. ... —
Isothermos, Société Internationale des Applications —

Jackson Vibrators, Inc. ... —

Kaye, Joseph, & Sons, Ltd. 49
Kearns, H. W., & Co., Ltd. —
Kearsley, Robert, & Co. ... —
Kendall & Gent, Ltd. ... —
Kenitra Co., Ltd. 41
King, George W., Ltd. ... 18
Kisha Seizo Kaisha, Ltd. ... —
Kitchen & Wade, Ltd. ... —
Klockner-Humboldt-Deutz, A.G. ... ... —
Krauss, Maffei, A.G. ... —
Kretz, P., Ing., Dipl. ... —
Krupp, Fried, Maschinenfabriken ... ... —
Kugelfischer Georg Schafer & Co. ... ... —
Kyosan Electric Mfg. Co., Ltd. ... ... —

Lace Web Spring Co., Ltd. —
Lamp Manufacturing & Railway Supplies, Ltd. ... —
Lang, John, & Sons, Ltd.... —
Laningraph Ltd. ... —
Lansing Bagnall, Ltd. ... —
Laycock Engineering, Ltd. —
Le Carbone (Great Britain), Ltd. ... ... —
Leeds Engineering & Hydraulic Co., Ltd. ... —
Levick, John, Ltd. ... —
Lifting Gear Products (Engineering), Ltd. ... —
Lockheed Precision Products, Ltd. ... ... —
Lockspike, Ltd. 44
Londex Ltd. ... ... —
London Transport Executive —
Luwa, G.m.b.H. 25

Macdonald, John, & Co. (Pneumatic Tools), Ltd.... —
Marcroft Wagons, Ltd. ... —
Marsden, Samuel, & Son, Ltd. ... ... —
Marston Excelsior, Ltd. ... —
Maschinenfabrik Augsburg-Nurnberg, A.G. ... —
Massey, B. & S., Ltd. ... —
Matisa Equipment, Ltd. ... —
Maus, J.M.J., Ltd.... ... —
Metalastik, Ltd. ... ... —
Miner, W. H. Inc. ... —
Metallic Seamless Tube Co., Ltd. ... ... —
Metropolitan-Cammel Carriage & Wagon Co., Ltd. 8
Mills, The Exors. of James, Ltd. ... ... —
Mirrlees, Bickerton & Day, Ltd. 15
Mitchell, Shackleton & Co., Ltd. 31

Mobil Oil Co., Ltd. ... —
Monarch Controller Co., Ltd. ... ... —
Murex Welding Processes, Ltd. ... ... —

National Provincial Bank... —
Neal, R. H., & Co., Ltd. ... —
Newton Bros. (Derby), Ltd. —
Nife Batteries, Ltd.... ... —
Nippon Signal Co., Ltd. ... —
North Bar Tool Co., Ltd.... 48
North British Locomotive Co., Ltd. ... ... —
Northern Aluminium Co., Ltd. ... ... —
Nuts & Bolts (Darlaston), Ltd. ... ... —

Oleo Pneumatics, Ltd. ... —
Ormerod Shapers, Ltd. ... —
Osborn, Samuel, & Co., Ltd. —
Ottermill Switchgear, Ltd.... 13

P. & M. Co. (England), Ltd. 7
Palnut Co., Ltd., The ... —
Parkinson Cowan Industrial Products, Ltd. ... ... —
Parkinson, J., & Son (Shipley), Ltd. ... ... —
Patterson Hughes Engineering Co., Ltd. ... ... —
Pearson Machine Tool Co., Ltd. ... ... —
Pel, Ltd. 32
Permali, Ltd. ... ... —
Peters, G. D., & Co., Ltd.... —
Philplug, Ltd. 23
Pirelli-General Cable Works, Ltd. 11
Planwell Engineering Co., Ltd. ... ... —
Plasser & Theurer 19
Plasser Railway Machinery (G.B.), Ltd. ... ... —
Powell Duffryn Engineering Co., Ltd. ... ... —
Preformed Line Products (Gt. Britain), Ltd. ... —
Pressed Steel Co., Ltd. ... —
Provident Mutual Life Assurance Association ... —

Railko, Ltd. ... ... —
Railway Signal Co., Ltd. ... 39
Ransomes & Rapier, Ltd. 26, 27
Rawlings Manufacturing Co., Ltd. ... ... —
Regent Oil Co., Ltd. ... —
Reyrolle, A., & Co., Ltd.... 35
Rheinstahl Siegener Eisenbahnbedarf, A.G. ... —
Richards, Chas., & Sons, Ltd. ... ... —
Roberts, Charles, & Co., Ltd. ... ... —
Roberts, J. W., Ltd. ... —
Rolls-Royce, Ltd. ... —
Rozalex, Ltd. ... ... —
Ruston & Hornsby, Ltd. ... —

Sankey, Joseph, & Sons, Ltd. ... ... —
Saunders Valve Co., Ltd.... —
Scammell Lorries, Ltd. ... —
Scottish Machine Tool Corporation, Ltd. ... —
Setright Registers, Ltd. ... —
Sheffield Twist Drill & Steel Co., Ltd. ... ... —
Siebe Gorman & Co., Ltd. —
S.G.E. Signals, Ltd. ... 30
Siemens & Halske, Akt. ... —
Silentbloc, Ltd. ... ... —
Simmonds Aerocessories, Ltd. 14
Simmonds & Stokes (Niphan), Ltd. ... ... —
Skefko Ball Bearing Co., Ltd. ... ... —
Smith's Industrial Instruments, Ltd. ... ... —
Smith, John (Keighley), Ltd. —
Smith, Thos., & Sons (Rodley), Ltd. ... ... —
Smith, W., Gilmour & Co., Ltd. ... ... —
Southern Forge Co., Ltd. ... 34
South Wales Switchgear Co., Ltd. 17
S.P.E. Co., Ltd. ... ... —
Spencer Moulton, George, & Co., Ltd. ... ... —
Standard Telephones & Cables, Ltd. 36
Steel Coy. of Wales, Ltd. ... —
Steel, Peech & Tozer ... —
Steels Engineering Products, Ltd. ... ... —
Stirk, John, & Sons, Ltd. ... —
Stone, J., & Co. (Deptford), Ltd. ... ... —
Stream Line Filters, Ltd. ... —
Suffolk Iron Foundry (1920), Ltd. 40
Sulzer Bros. (London), Ltd. —
Summerson, Thos., & Sons, Ltd. ... ... —
Swiss Industrial Company... —
Swiss Locomotive & Machine Works ... ... —
Sylglas Company, The ... 40

Talbot Waggonfabrik ... —
Tangyes, Ltd. ... ... —
Taylor Bros. & Co., Ltd. ... —
Taylor Bros. (Sandiacre), Ltd. 45
Taylor, F., & Sons (Manchester), Ltd. ... ... —
Taylor Rustless Fittings Co., Ltd. ... ... —
Tearne & Sons, Ltd. ... —
Tees Side Bridge & Engineering Works, Ltd. ... —
Telephone Manufacturing Co., Ltd. ... ... —
Thermit Welding (Gt. Britain), Ltd. ... ... —
Thomas, Richard, & Baldwins, Ltd. ... ... —
Thompson, John, Motor Pressings, Ltd. ... ... —
Thomson, Thomas, Sons & Co. (Barrhead), Ltd. ... —
Toledo Woodhead (Sheffield), Ltd. ... ... —
Town, Fredk., & Sons, Ltd. —
Transport Brakes, Ltd. ... —
Transport Engineering & Equipment, Ltd. 50
Trico-Folberth, Ltd. ... —
Tulloch, Ltd. ... ... —
Turton, Geo., Platts & Co., Ltd. ... ... —
Turton, Thos., & Sons, Ltd. —
Tyer & Co., Ltd. ... ... —

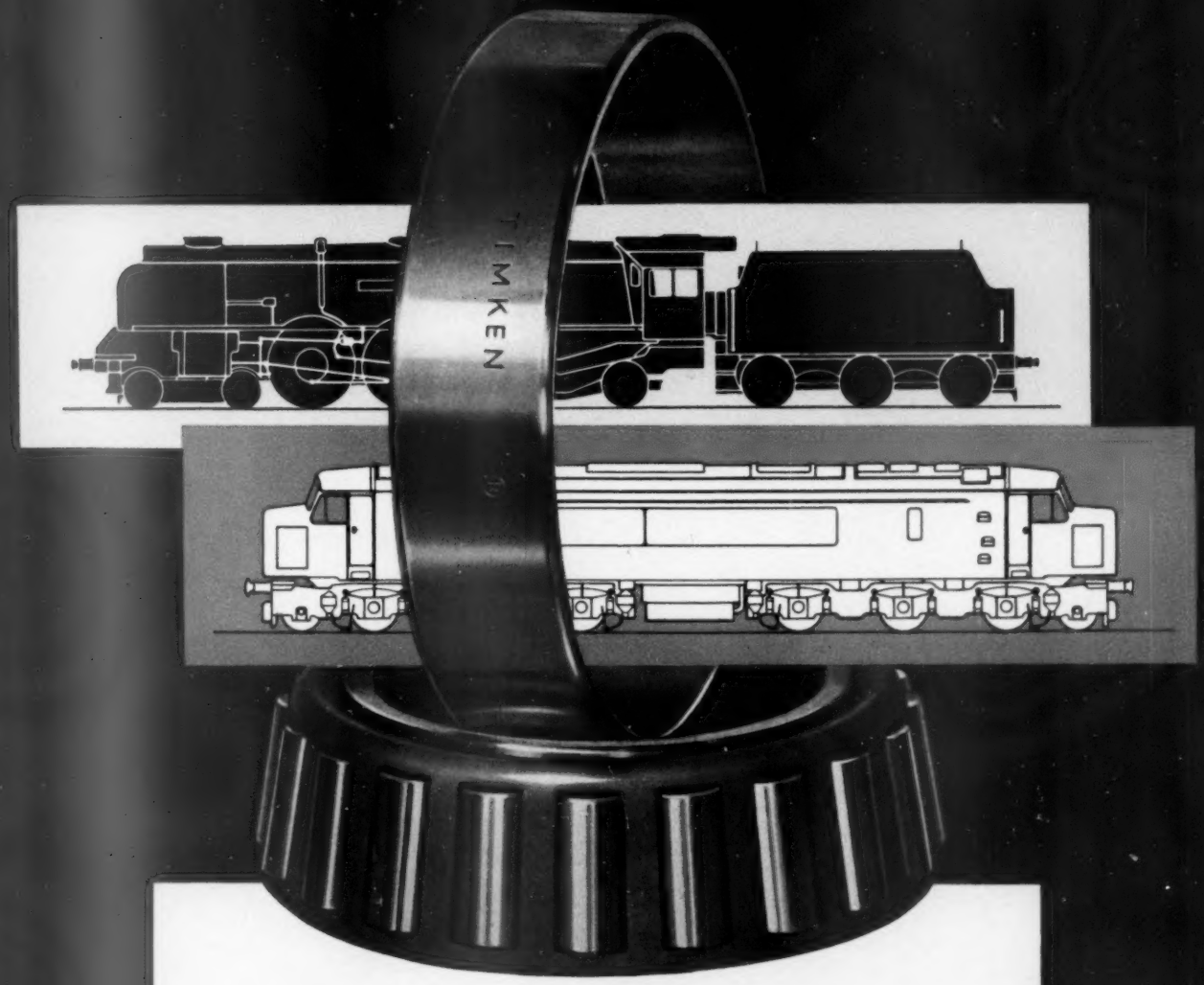
United Steel Companies, Ltd. 3

Vacuum Brake Co., Ltd. ... 10
Vokes, Ltd.... ... ... —
Vulcanised Fibre, Ltd. ... —

Walker, James, & Co., Ltd. —
Ward, H. W., & Co., Ltd. ... 38
Ward, Thos. W., Ltd. ... —
Werkspoor, N.V. ... ... —
Westinghouse Brake & Signal Co., Ltd. 5
White, R., & Sons (Engineers), Ltd. ... ... —
Wickham, D., & Co., Ltd.... —
Wild, A. G., & Co., Ltd. ... —
Williams, Henry, Ltd. ... —
Winn & Coales, Ltd. ... —
Workington Iron & Steel Co. 3
Wright Anderson & Co., Ltd. 9
Wynn-Williams, Llewelyn, Ltd. ... ... —

Zwicky, Ltd. ... ... —

LONDON: Printed by ODHAMS PRESS LTD., Long Acre, W.C.2, and Published by TOTHILL PRESS LIMITED, Proprietors of THE RAILWAY GAZETTE, at 33, Tothill Street, Westminster, S.W.1.
April 14, 961



CARRYING HEAVY LOADS

The 4-6-2 Class 8 steam locomotive illustrated has a total rail weight of 165 tons: the 2300 h.p. Type 4 diesel-electric locomotive weighs 138 tons complete.

For both these classes of locomotive, with their high axle loading, British Railways selected Timken bearings for all axles.

The B.R. ex L.M.S. steam locomotive was built at Crewe, the B.R. diesel-electric locomotive was built at Derby, both in the L.M. region.

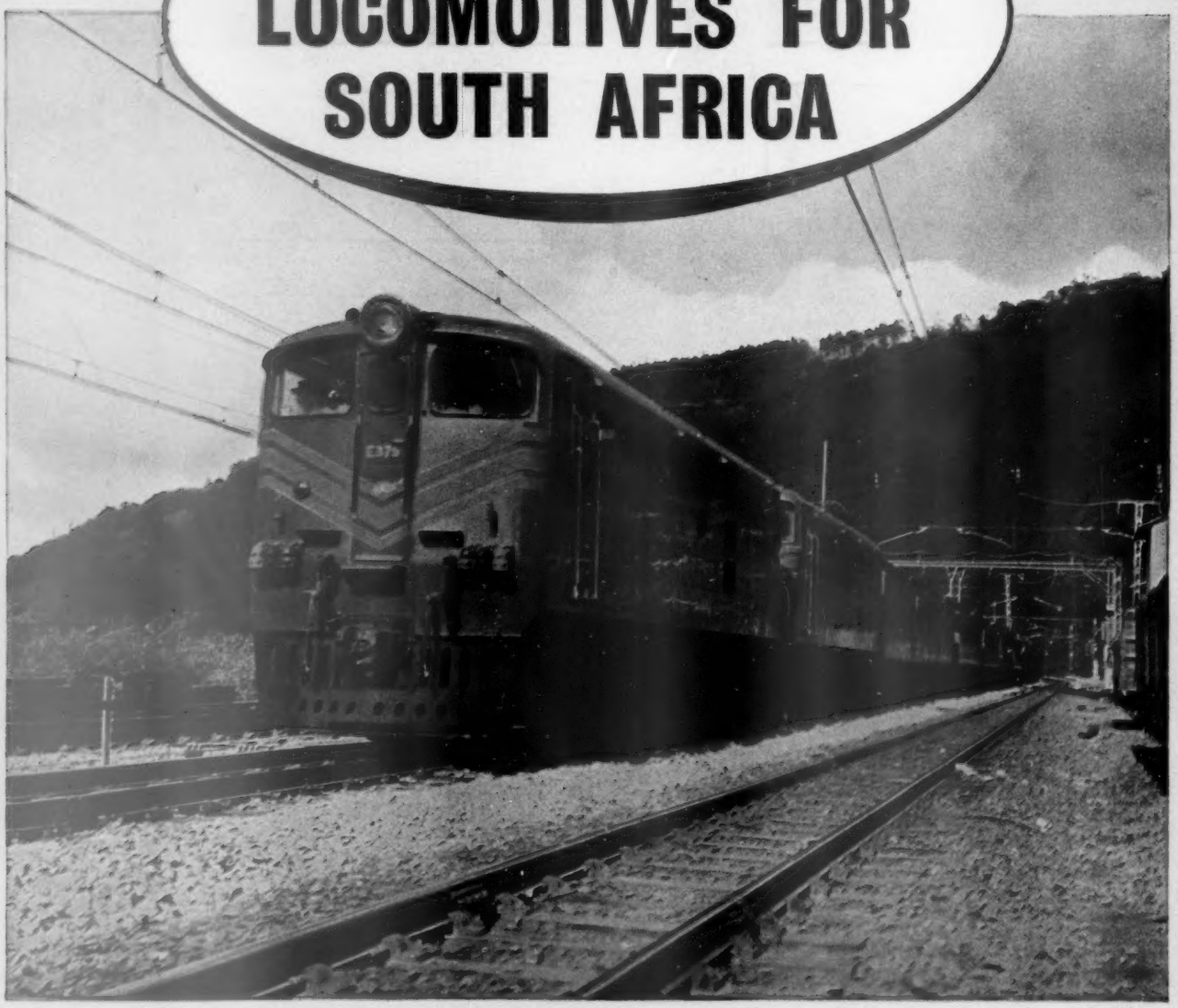
British Timken, Duston, Northampton, Division of The Timken Roller Bearing Company. Timken bearings manufactured in England, Australia, Brazil, Canada, France and U.S.A.

TIMKEN®

REGISTERED TRADE-MARK

tapered roller bearings

AEI 3000 volt LOCOMOTIVES FOR SOUTH AFRICA



Two of the 135 AEI 3000 volt 2280 hp 84 ton D.C. electric locomotives, in service with South African Railways.

No fewer than 345 electric locomotives have now been ordered from AEI by this customer together with 350 sets of motor coach equipment for the Reef and Cape Western electrifications.

Enquiries to AEI Traction Division, Trafford Park, Manchester 17, or your local AEI Office

AEI **Associated Electrical Industries Ltd.**
Traction Division
MANCHESTER · RUGBY · LONDON
K/T018